Brother Laser Printer



HL-7050 series

User's Guide

For visually-impaired users

Please see the two HTML files, index_win.html and index_mac.html, on the supplied CD-ROM. You can read them with Screen Reader ‘text-to-speech’ software.

For information on the use of the Braille control panel with buzzer function, see *Chapter 3*.

You must set up the hardware and install the driver before you can use the printer. Please use the Quick Setup Guide to set up the printer. You can find a printed copy in the box or view it on the CD-ROM we have supplied.

Please read this Guide thoroughly before you use the printer. Keep the CD-ROM in a convenient place so you can use it quickly if you need to.

Please visit our website at **http://solutions.brother.com** where you can get answers to Frequently Asked Questions (FAQs), Product Support and Technical Questions, and the latest Driver Updates and Utilities.

Version 2

brother

Laser printer

HL-7050 series

User's Guide

Definitions of warnings, cautions and notes

We use the following terms throughout this User's Guide.

WARNING You must follow these warnings to prevent possible personal injury.

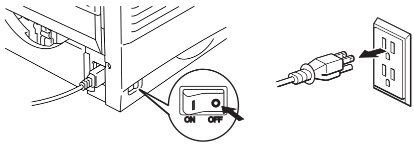
You must follow these instructions to make sure you use the printer properly and do not damage it.

Remember these useful tips when you use the printer.

To use the printer safely

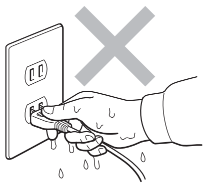
WARNING

There are high voltage electrodes inside the printer. Before you clean the printer, clear a paper jam or replace parts, make sure you have turned off the power switch and unplugged the printer from the AC power outlet.



WARNING

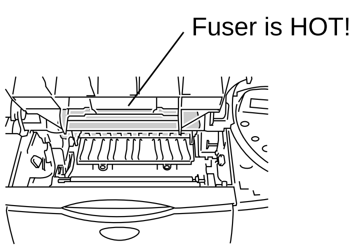
Do not handle the plug with wet hands - it might give you an electrical shock.



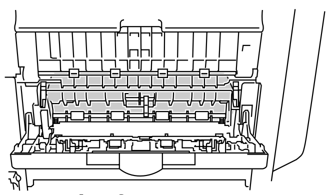
WARNING

High Temperature

After you have just used the printer, some parts inside the printer will be extremely hot. When you open the front or back cover of the printer, never touch the shaded parts shown in the illustrations below.



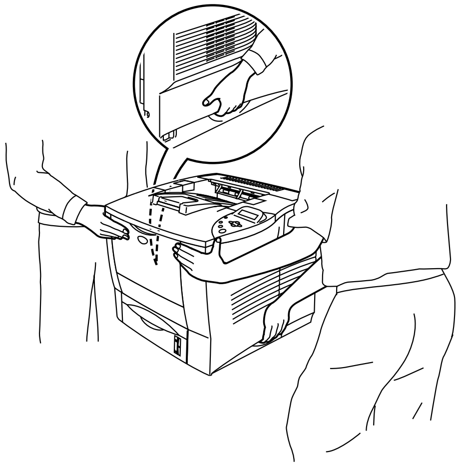
Inside the printer



Open the face-up output tray

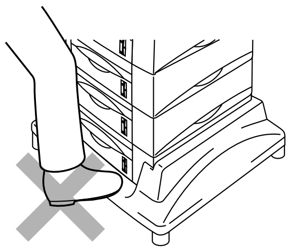
WARNING

To prevent injuries, at least two people should lift the printer, holding the handles on both the right and left sides of the printer, and the front of the printer as shown in the illustration below.



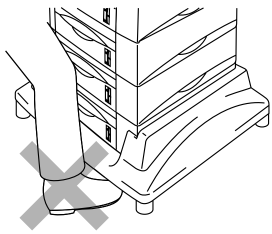
WARNING

Do not stand on the printer or the optional Stabilizer unit.



WARNING

Be careful not to trip on the legs of the optional Stabilizer unit.



Brother Numbers (USA and Canada)

IMPORTANT: For technical help you must call the country where you bought the Printer. Calls must be made ***from within*** that country.

Register your product

By registering your product with Brother International Corporation, you will be recorded as the original owner of the product. Your registration with Brother:

- may serve as a confirmation of the purchase date of your product should you lose your receipt;
- may support an insurance claim by you in the event of product loss covered by insurance; and,
- will help us notify you of enhancements to your product an special offers.

Please complete the Brother Warranty Registration or, for you convenience and most efficient way to register your new product, register on-line at

www.registermybrother.com

Frequently asked questions (FAQs)

The Brother Solutions Center is our one-stop resource for all your Printer needs. You can download the latest software and utilities, read FAQs and troubleshooting tips, and go to the 'Solutions' section to learn how to get the most from your Brother product.

http://solutions.brother.com

You can check here for the Brother driver updates.

Customer Service

In USA 1-800-276-7746

In Canada 1-877-BROTHER
(514) 685-6464 **(In Montreal)**

If you have any comments or suggestions, please write to us at:

In USA
Printer Customer Support
Brother International Corporation
15 Musick
Irvine CA 92618

In Canada
Brother International Corporation (Canada), Ltd.
- Marketing Dept.
1, rue Hôtel de Ville
Dollard-des-Ormeaux, PQ, Canada H9B 3H6

Service center locator (USA only)
For the location of a Brother authorized service center, call 1-800-284-4357.

Service center locations (Canada only)
For the location of a Brother authorized service center, call 1-877-BROTHER.

Brother fax back system (USA only)
Brother Customer Service has an easy-to-use fax back system so you can get instant answers to common technical questions and product information. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine.

Call the number below and follow the recorded instructions to receive a fax about how to use the system and an Index of the subjects you can get information about.

In USA only 1-800-521-2846

Internet addresses

Brother Global Web Site:

http://www.brother.com

For Frequently Asked Questions (FAQs), Product Support and Technical Questions, and Driver Updates and Utilities:

http://solutions.brother.com

(In USA Only) For Brother Accessories & Supplies:

http://www.brothermall.com

Important information: Regulations

Federal Communications Commission (FCC) Declaration of Conformity (For USA)

Responsible Party:	Brother International Corporation 100 Somerset Corporate Boulevard P.O. Box 6911 Bridgewater, NJ 08807-0911 USA Telephone: (908) 704-1700

declares, that the products

Product name:	Laser Printer
Model number:	HL-7050 and HL-7050N
Product options:	Lower Tray Unit LT-7000, Duplex Unit DX-7000, Network Card NC-4100h, Mailbox Unit MX-7000, MX-7010

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important
A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Radio interference (220-240 volt model only)

This printer follows EN55022 (CISPR Publication 22)/Class B.

Before you use this product, make sure that you use a double-shielded interface cable with twisted-pair conductors and that it is marked "IEEE1284 compliant". The cable must not be more than 1.8 metres long.

brother

"EC" Declaration of Conformity

Manufacturer
Brother Industries Ltd.,
15-1, Naeshiro-cho, Mizuho-ku,
Nagoya 467-8561, Japan

Plant
Brother Technology (Shenzhen) Ltd.
NO6 Gold Garden Ind. Nanling Buji,
Longgang, Shenzhen, China

Plant
Brother Industries Ltd.,
Kariya-shi, Aichi-ken 448-0803 Japan

Herewith declare that:

Product description : Laser Printer
Product Name : HL-7050, HL-7050N

are in conformity with provisions of the Directives applied : Low Voltage Directive 73/23/EEC (as amended by 93/68/EEC) and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC and 93/68/EEC).

Standards applied :
Harmonized : Safety : EN60950:2000

EMC : EN55022:1998 Class B
EN55024:1998
EN61000-3-2:1995 + A1:1998 + A2:1998
EN61000-3-3:1995

Year in which CE marking was first affixed : 2002

Issued by : Brother Industries, Ltd.

Date : 28 March, 2002

Place : Nagoya, Japan

Signature :

Kazuhiro Dejima
Manager
Quality Audit Group
Quality Management Dept.
Information & Document Company

Laser Safety (110 to 120 volt Model Only)

This printer is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA Regulations (110 to 120 volt Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
Brother Industries, Ltd.,
15-1 Naeshiro-cho Mizuho-ku Nagoya, 467-8561 Japan
This product complies with FDA radiation performance standards, 21 CFR subchapter J.

MANUFACTURED:
Brother Technology (Shenzhen) Ltd.
NO6 Gold Garden Ind. Nanling Buji, Longgang, Shenzhen, CHINA
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

IEC 60825 specification (220 to 240 volt model only)

This printer is a Class 1 laser product as defined in IEC 60825 specifications. The label shown below is attached in countries where it is needed.



This printer has a Class 3B laser diode which produces invisible laser radiation in the scanner unit. You should not open the scanner unit under any circumstances.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

For Finland and Sweden
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus!	Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.
Varning	Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

Internal laser radiation

Maximum radiation power:	15 mW
Wave length:	760 - 810 nm
Laser class:	Class IIIb (Accordance with 21 CFR Part 1040.10) Class 3B (Accordance with IEC 60825)

IMPORTANT - For Your Safety

To ensure safe operation the supplied three-pin plug must be inserted only into a standard three-pin power outlet that is properly grounded through the standard electrical wiring.

Extension cords used with this printer must be three-pin plug type and correctly wired to provide proper grounding. Incorrectly wired extension cords may cause personal injury and equipment damage.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, call a qualified electrician.

Disconnect device
You must install this printer near a power outlet that is easily accessible. In case of an emergency, you must disconnect the power cord from the power outlet to shut off the power completely.

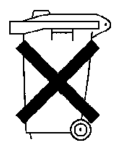
Caution for batteries
Do not replace the battery. There is a danger of explosion if the battery is incorrectly replaced. Do not disassemble, recharge or dispose of the battery in fire. Dispose of used batteries according to local regulations.

Caution for LAN connection
Connect this product to a LAN connection that is not subjected to over voltages.

IT power system (For Norway only)
This product is also designed for an IT power system with phase-to-phase voltage 230V.

Opmerking / Oplaadbare Batterij Recycle Informatie (For Netherlands Only)

Bij dit product zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als Klein Chemisch Afval.



Geräuschemission / Acoustic noise emission (for Germany only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

Wiring information (for UK)

Important

If the mains plug that is supplied with this printer is not suitable for your plug socket, remove the plug from the mains lead and fit an appropriate three-pin plug. If the replacement plug needs a fuse, fit the same fuse as the original.

If a moulded plug comes off the mains lead, you should destroy it because a plug with cut wires is dangerous if it is put in a live plug socket. Do not leave it where a child might find it!

If you need to replace the plug fuse, fit a fuse that is approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug that does not have a cover.

Warning - This printer must be earthed.

The wires in the mains lead are coloured in line with the following code :

Green and Yellow:	**Earth**
Blue:	**Neutral**
Brown:	**Live**

The colours of the wires in the mains lead of this printer may not match the coloured markings identifying the terminals in your plug.

If you need to fit a different plug, you should do the following.

Remove a bit of the outer cover of the lead, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If you can, leave the green and yellow wire longer than the others so that, if the lead is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter "E" or the safety earth symbol ⏚, or coloured green or green and yellow.

The wire, which is coloured blue, must be connected to the terminal, which is marked with the letter "N" or coloured black or blue.

The wire, which is coloured brown, must be connected to the terminal, which is marked with the letter "L" or coloured red or brown.

The outer cover of the lead must be secured inside the plug. The coloured wires should not hang out of the plug.

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Under the supervision of Brother Industries Ltd., this manual has been compiled and published, covering the latest product's descriptions and specifications.

The contents of this manual and the specifications of this product are subject to change without notice.

Brother reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

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Table of Contents

1 About this printer

What is in the box?

When you unpack the printer, check to see that you have all of the following parts.

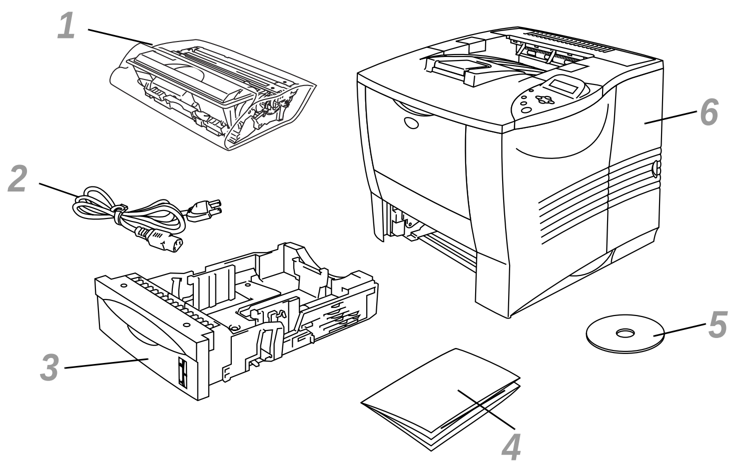


Figure 1-1

1 Drum Unit Assembly (Drum Unit with Toner Cartridge)

2 AC Power Cord

3 Paper Tray

4 Quick Setup Guide

5 CD-ROM

6 Printer

- An interface cable is not a standard accessory. Some computers have a USB and a parallel port. Please buy the appropriate cable for the interface you are going to use.
- Most parallel cables support bi-directional communication, but some might have an incompatible pin assignment or may not be IEEE 1284-compliant.
- Do not use a parallel cable that is longer than 1.8 metres (6 feet).
- The power cord length may differ slightly depending on the country where you bought the printer.
- If you use a USB cable, make sure it is a high-speed twisted cable (12 Mbps), and that you connect it to the USB connector of your PC. Do not connect the USB cable to the front of your PC or to the iMac's keyboard.

For visually impaired users we have prepared two HTML files on the supplied CD-ROM: index_win.html and index_mac.html. These files can be read by Screen Reader 'text-to-speech' software.

What is on the CD-ROM? (For Windows®)



1 **Install Software**

You can install the printer driver and the following items:

For All Users (*For more information, see Chapter 2*)
- Printer Driver

For Administrators
- Web BRAdmin
- BRAdmin Professional
- Driver Deployment Wizard
- Network Print Software
- Storage Manager
- Analysis Tool

2 **Documentation**

Look at the printer User's Guide, Network User's Guide and other documents.

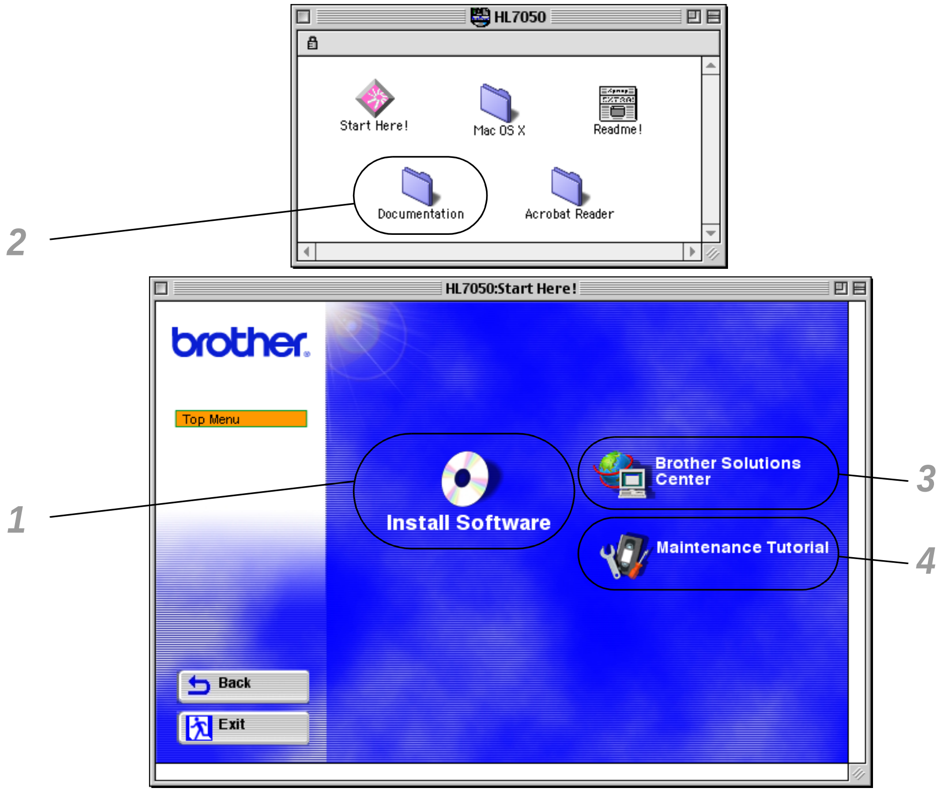
3 **Brother Solutions Center**

An introduction to our website. You can easily access it and receive the latest drivers and information for this printer.

4 **Maintenance Tutorial**

See the maintenance videos for this printer. We recommend that you watch the videos before getting started.

What is on the CD-ROM? (For Macintosh® on a Network)



1 **BR-Script PPD Installer**

Printer driver (*For more information, see Chapter 2*)

This printer supports Mac© OS versions 8.6 - 9.2 and Mac© OS X 10.1 or later.

2 **User's Guides**

Look at the printer User's Guide, Network User's Guide and other documents.

3 **Brother Solutions Center**

An introduction to our website. You can easily access it and receive the latest drivers and information for this printer.

4 **Maintenance Tutorial**

See the maintenance videos for this printer. We recommend that you watch the videos before getting started.

General view

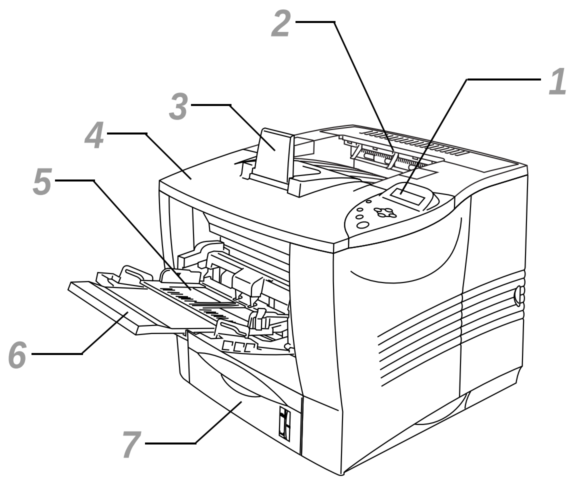


Figure 1-2

1 Control Panel

2 Face-down Output Tray

3 Support Flap

4 Top Cover

5 Multi-purpose Tray

6 Multi-purpose Extension Support

7 Paper Tray (Tray 1)

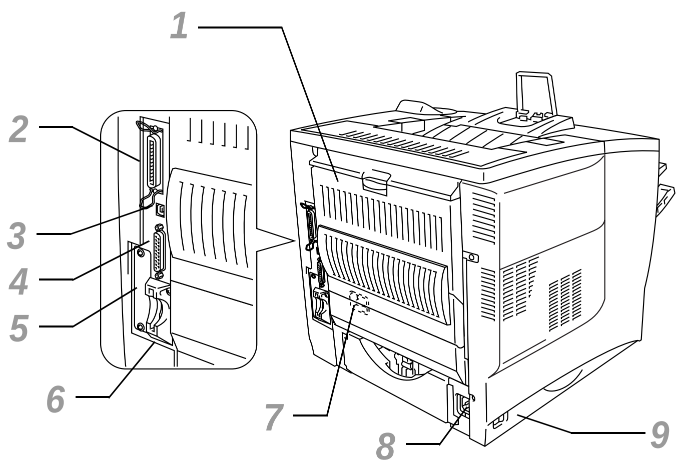


Figure 1-3

1 Face-up Output Tray

2 Parallel Interface Connector

3 USB Connector

4 Serial Interface Connector

5 Network Board Slot

6 Card Slot
(For optional CompactFlash™ card)

7 Duplex Unit Connector

8 AC Power Connector

9 Power Switch

Positioning the printer

Please read the following before you use the printer.

Power supply

Use the printer within the recommended power range:

AC power:	±10% of the rated voltage
Frequency:	50/60 Hz (220-240 V) or 50/60 Hz (110-120 V)

The power cord, including extensions, should be no longer than 5 metres (16½ feet).

Do not share the same power circuit with other high-power appliances, such as an air conditioner, copier, shredder and so on. If you cannot avoid using the printer with these appliances, we recommend that you use a voltage transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

Only use the printer within the following ranges of temperature and humidity:

Possible operation range	
Temperature:	10°C to 32.5°C (50°F to 90.5°F)
Humidity:	20% to 80% (without condensation)

Recommended operation range	
Temperature:	17.5°C to 25°C (63.5°F to 77°F)
Humidity:	30% to 70% (without condensation)

The machine must be level within 5 mm (0.2 in.) both front-to-back and left-to-right.

To avoid ozone building up, put this machine in a large well-ventilated room.

Space needed to install your printer

Leave enough space around the printer. You will need this space to use the printer properly. The recommended (or minimum) space requirements are as follows.

No Options

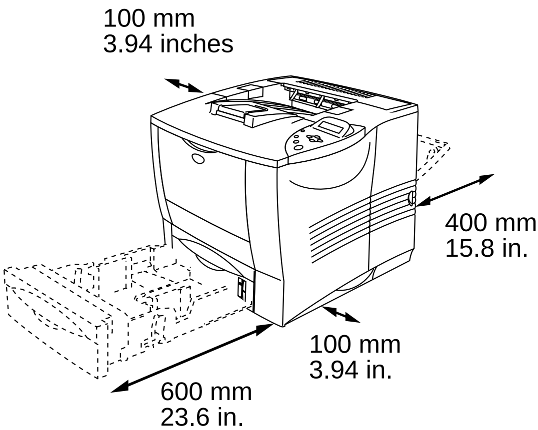


Figure 1-4

Install Optional Duplex Unit, Lower Tray and Mailbox.

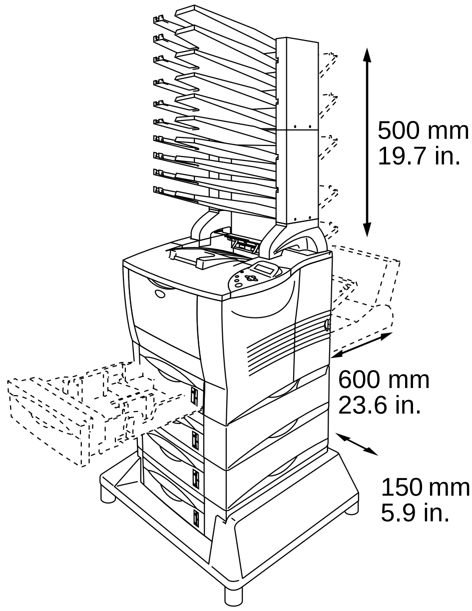


Figure 1-5

- Do not put the printer in direct sunlight. If you have to put it near a window, use a blind or a heavy curtain to protect the printer from direct sunlight.
- Do not install the printer near other electronic equipment.
- Do not drop, bang or shake the printer. Do not put the printer on a surface that vibrates. Do not expose the printer to open flames or salty or corrosive gases.
- Keep the printer clean. Do not put the printer in a dusty place.
- Do not put the printer near an air conditioner or humidifier.
- Make sure that the power outlet is near the machine and is easy to get to so that, if there is an emergency, it can be easily unplugged.
- Only connect the machine to the power source described under Power Supply in this User's Guide.
- Put the printer on a flat, horizontal surface.
- Do not damage, break or make any changes to the power cord. Do not put heavy objects on it, pull it hard or bend it more than necessary. These actions could damage the cord. A frayed or damaged cord might cause an electrical fire hazard.
- Ventilate the room where you are using the printer.
- Do not put the printer where the ventilation hole of the printer is blocked. Keep a gap of approximately 100 mm (4 in.) between the ventilation hole and the wall.
- Be careful not to trip on the legs of the base unit.

What kind of paper can I use?

Type and size of paper

The LCD names for the paper trays are as follows.

Paper Tray	TRAY1
Multi-purpose Tray	MP TRAY
Optional Lower Tray	TRAY2, TRAY3, TRAY4
Optional Duplex Unit for Duplex Printing	DX
Optional Mailbox unit	MX

The definition of the media type (paper weight) is shown below.

Plain paper	70 g/m^2 to 90 g/m^2 (19 to 24 lb)
Bond paper	Rough paper - 60 g/m^2 to 200 g/m^2 (16 to 53 lb)
Thick paper	90 g/m^2 to 120 g/m^2 (24 to 32 lb)
Thicker paper	120 g/m^2 to 200 g/m^2 (32 to 53 lb)
Transparency	Overhead projector film
Thin paper	60 g/m^2 to 70 g/m^2 (16 to 19 lb)

When you print on thick paper, labels or card stock, we recommend that you select the media type from the printer driver according to the paper weight as shown in the table above.

Media type (Type of paper)	Tray 1 60 - 105 g/m^2 (16 - 28 lb)	MP tray 60 - 200 g/m^2 (16 - 53 lb)	Tray 2/3/4 60 - 105 g/m^2 (16 - 28 lb)	DX 60 - 105 g/m^2 (16 - 28 lb)	MX 60 - 105 g/m^2 (16 - 28 lbs.)	Select the Media type from the printer driver
Plain paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	Plain paper
Recycled paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	Plain paper
Bond paper	ⓘ	ⓘ	ⓘ		ⓘ	Bond paper
Thick paper		ⓘ				Thick paper or Thicker paper
Transparency		ⓘ A4 or Letter				Transparency
Labels		ⓘ A4 or Letter				Plain paper
Envelope		ⓘ				Envelope
Card stock		ⓘ				Thick paper or Thicker paper
Thin paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	Thin paper

When looking at this page on the CD-ROM, you can jump to the page for each printing method by clicking the ⓘ in the table.

	Tray 1	MP tray	Tray 2/3/4
Paper size	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5, A6, B6	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5, A6, B6 COM-10, Monarch, C5, DL Width: 105 to 216 mm (4.13 to 8.5 in.) Height: 148.5 to 356 mm (5.85 to 14.0 in.)	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5
Number of Sheets	500 sheets (80 g/m^2 or 20 lb)	100 sheets (80 g/m^2 or 20 lb) Transparency: 10 sheets Envelope: 10 sheets Label stock: 10 sheets	500 sheets (80 g/m^2 or 20 lb)

	DX	MX
Paper size	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive	A4, Letter, B5 (JIS), B5 (ISO), Executive
Number of Sheets		100 sheets per bin (80 g/m^2 or 20 lb)

You must use the face-up output tray for certain print media.

Media type	Face-down	Face-up
Plain paper	ⓘ	ⓘ
Recycled paper	ⓘ	ⓘ
Bond paper	ⓘ	ⓘ
Thick paper	ⓘ	ⓘ
Thicker paper	ⓘ	ⓘ
Transparency	ⓘ	ⓘ
Labels		ⓘ
Envelope		ⓘ
Card stock		ⓘ
Thin paper	ⓘ	ⓘ

When looking at this page on the CD-ROM, you can jump to the page for each printing method by clicking the ⓘ in the table.

You can use the control panel Menu buttons to select the priority of the paper source in the PAPER menu. *For more information about this setting, see Chapter 3*.

- If you print on thick paper that weighs more than 150 g/m^2 (40 lb), use face-up printing.
- We recommend that you use face-up printing when you print on transparencies.
- If the paper is misfeeding or a lot of pages are going through at the same time when you print on small or thick paper, change the paper thickness switches at the bottom of the paper tray. *For more information, see page 1-22*.

Media types in the driver settings

You can select the following media types in the driver.
Please see, Features in the printer driver in *Chapter 2*.

- Plain paper
- Thick paper
- Thicker paper
- Bond paper
- Transparency
- Envelope
- Thin paper

Recommended paper

Plain Paper	Xerox Premier 80 g/m^2 Xerox 4200DP 20 lb
Recycled Paper	Xerox Recycled Supreme 80 g/m^2
Transparency	3M CG3300
Label	Avery laser label #L7163 Avery laser label #5160

- Before you buy a lot of paper, please test some to make sure that the paper is suitable.
- Use paper that is made for plain-paper copying.
- Use paper that is 75 to 90 g/m^2 (20 to 24 lb).
- Use neutral paper. Do not use acidic or alkaline paper.
- Use long-grain paper.
- Use paper with a moisture content of approximately 5%.
- This printer can use recycled paper according to DIN 19309.

Printable area

When using PCL emulation, the edges of the paper that cannot be printed on are shown below.

Portrait

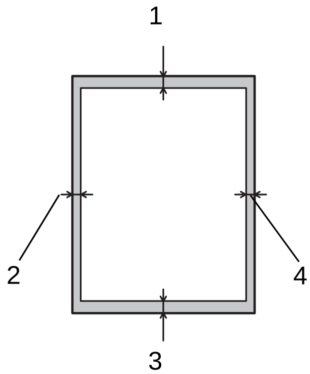


Figure 1-6

	A4	Letter	Legal	B5 (JIS)	B5 (ISO)	Executive	A5
1	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
2	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.35 mm (0.25 in)	5.84 mm (0.23 in)	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.01 mm (0.24 in)
3	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
4	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.35 mm (0.25 in)	5.84 mm (0.23 in)	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.01 mm (0.24 in)

	A6	B6	COM10	Monarch	C5	DL
1	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
2	6.01 mm (0.24 in)	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.35 mm (0.25 in)	6.01 mm (0.24 in)	6.01 mm (0.24 in)
3	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
4	6.01 mm (0.24 in)	6.01 mm (0.24 in)	6.35 mm (0.25 in)	6.35 mm (0.25 in)	6.01 mm (0.24 in)	6.01 mm (0.24 in)

Landscape

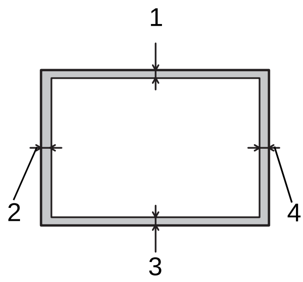


Figure 1-7

	A4	Letter	Legal	B5 (JIS)	B5 (ISO)	Executive	A5
1	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
2	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)
3	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
4	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)

	A6	B6	COM10	Monarch	C5	DL
1	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
2	5.0 mm (0.19 in)	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)	5.0 mm (0.19 in)
3	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)	4.2 mm (0.17 in)
4	5.0 mm (0.19 in)	5.0 mm (0.19 in)	5.08 mm (0.2 in)	5.08 mm (0.2 in)	5.0 mm (0.19 in)	5.0 mm (0.19 in)

Printing methods

Printing from the paper tray (Face-down printing)

1 Pull the paper tray out of the printer.

2 While pressing the [blue] paper-guide release lever, slide the paper guides to fit the paper size. Check that the guides are firmly in the slots.

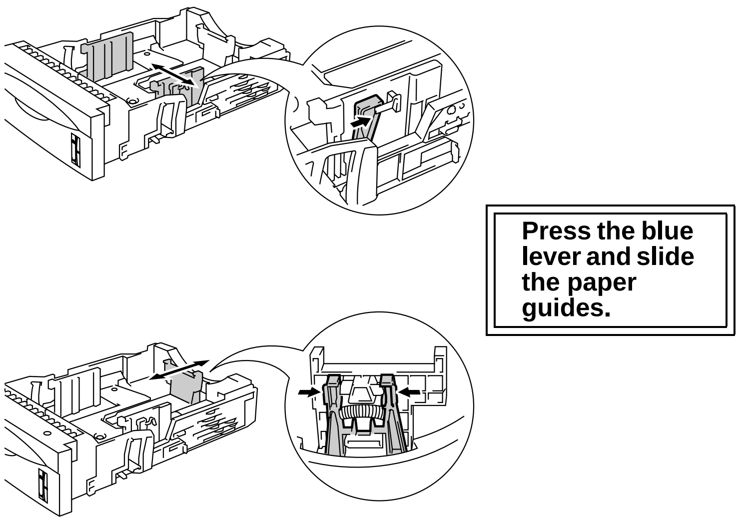


Figure 1-8

For Legal size paper, press the [blue] universal guide release button and pull out the rear of the paper tray.

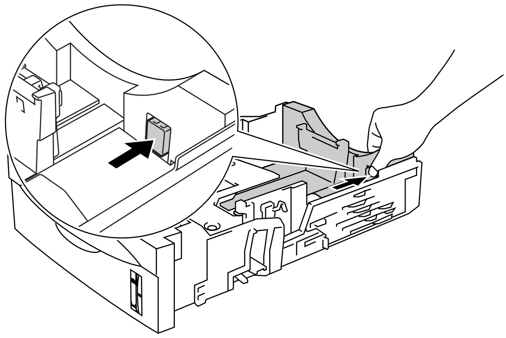


Figure 1-9

3 Put paper in the paper tray. Check that the paper is flat and below the maximum paper mark (▼).

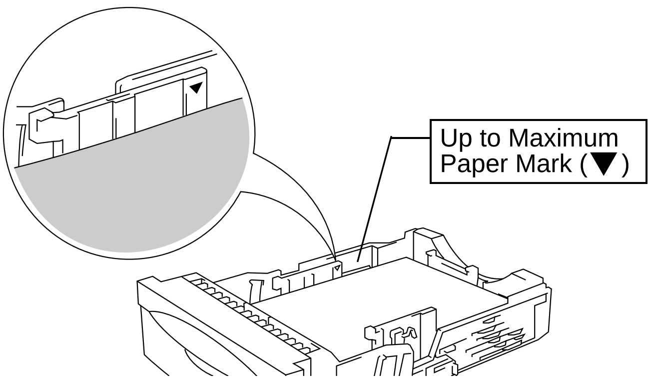
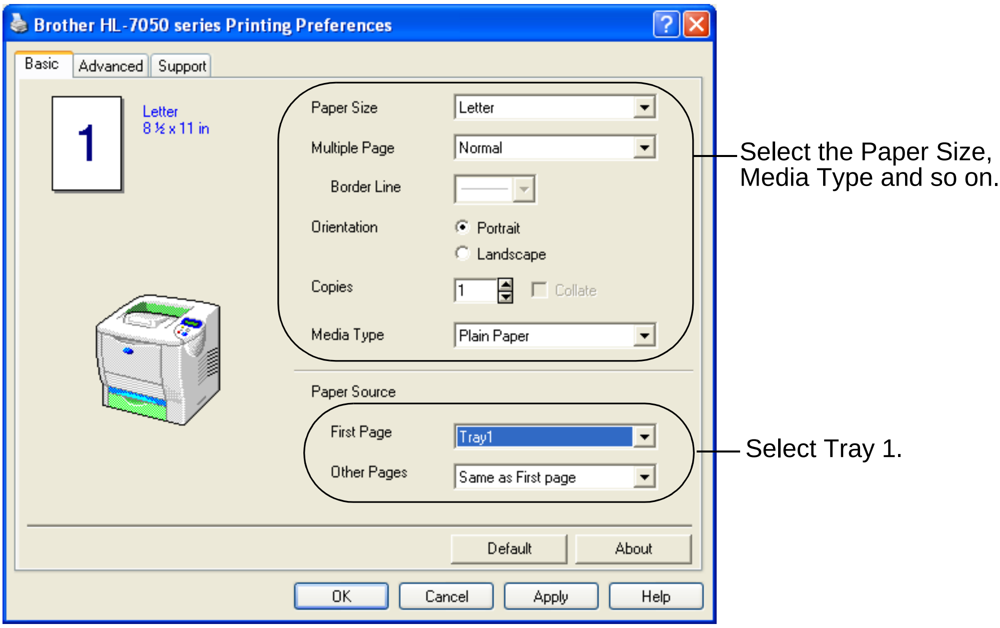


Figure 1-10

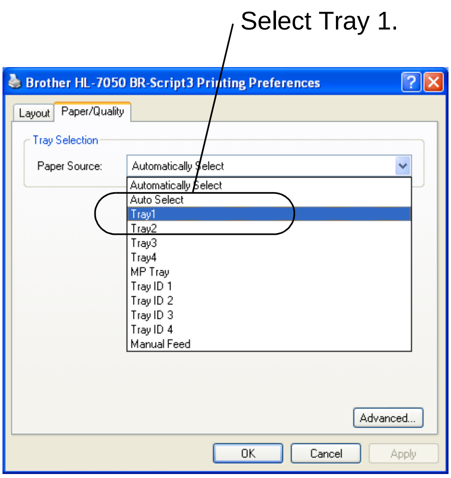
4 Put the paper tray back in the printer.

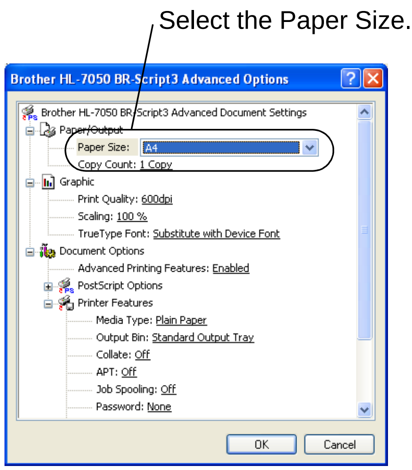
5 Change the following settings in the printer driver.

<PCL driver>



<PS driver>





If the paper is misfeeding or a lot of pages are going through at the same time when you print on small or thick paper, change the paper thickness switches at the bottom of the paper tray as follows.

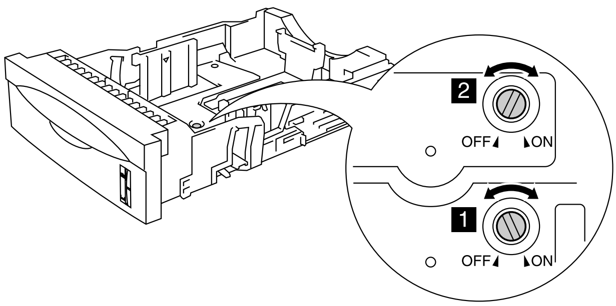


Figure 1-11

The switches shown in this figure are in the preset position (default setting).

A6	Switch 1: OFF Switch 2: OFF
A4 100 g/m^2 (27 lb) Letter 105 g/m^2 (28 lb) Legal 105 g/m^2 (28 lb)	Switch 1: ON Switch 2: ON
Executive, A5, B6	Switch 1: OFF Switch 2: ON
Other (Default setting)	Switch 1: ON Switch 2: OFF

Tray ID setting (If the lower tray unit is installed)

If somebody moves the tray into another tray position and you print the data without knowing this has been done, the driver finds the tray and prints according to this setting.

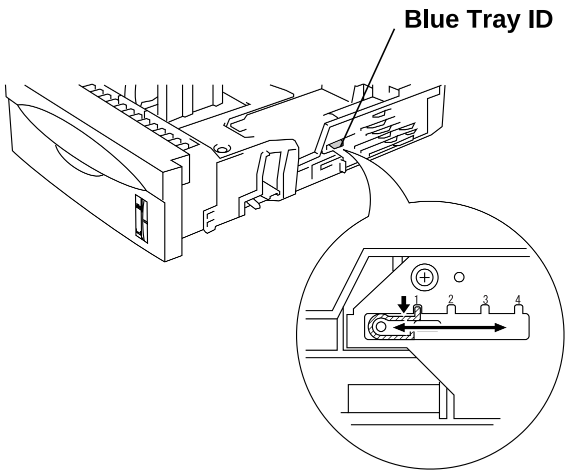


Figure 1-12

Printing from the multi-purpose tray

- For proper printing, you must select the same paper size in your software application as the paper in the tray.
- If your application software does not allow you to select the paper size in its Print menu, you can use the control panel Menu buttons to go to the PAPER menu to change the paper size. *For more information, see Chapter 3*.

1 Open the multi-purpose tray and lower it gently.

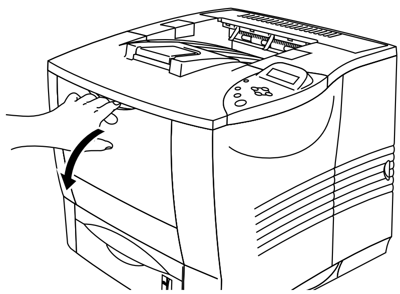


Figure 1-13

2 Pull out the multi-purpose support flap.

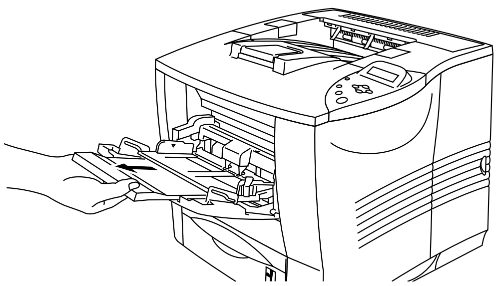


Figure 1-14

3 When loading paper in the multi-purpose tray, make sure it touches the back of the tray and remains below the maximum paper mark (▼).

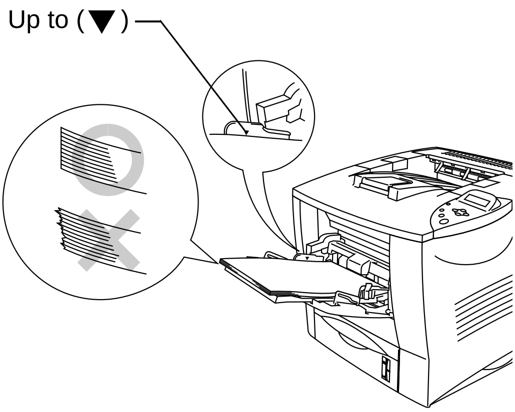


Figure 1-15

Make sure that the paper is neatly stacked and in the proper position on the multi-purpose tray. If it is not, the paper may not be fed correctly, resulting in a skewed printout or a paper jam.

4 While pressing the [blue] paper-guide release lever, slide the paper guide to fit the paper size.

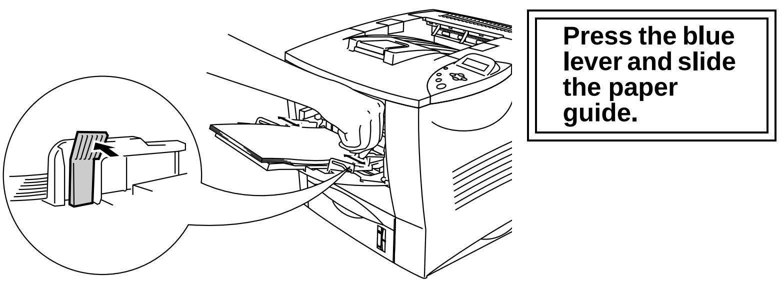


Figure 1-16

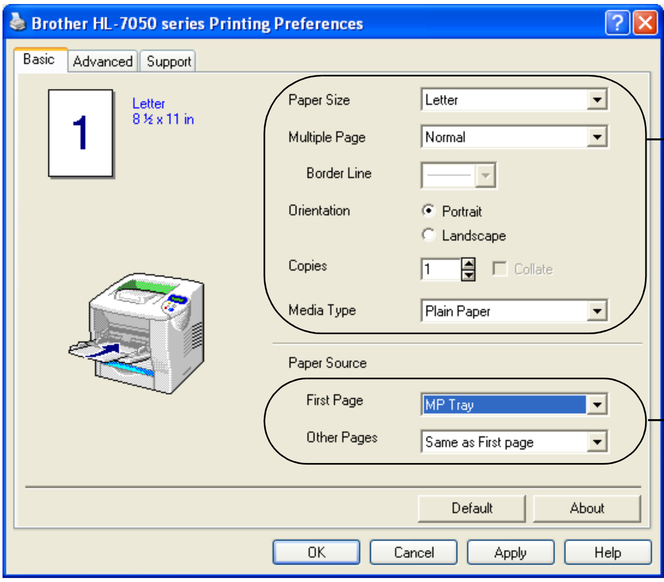
When you print on special paper such as envelopes, thick paper, labels, and so on, open the face-up output tray to print face up. See *Printing on envelopes (Face-up printing)* or *Printing on labels, transparencies and other special paper* in this chapter.

When you put paper in the multi-purpose tray, please remember the following:

- During printing, the inside tray rises to feed paper into the printer.
- The print surface must be face up.
- Put the leading edge of the paper in first and push it gently into the tray.
- The top of the paper stack must be under the maximum paper marks that are on both sides of the tray. The stack should be no more than 10 mm (0.39 in.) high.

5 Change the following settings in the printer driver.

<PCL driver>

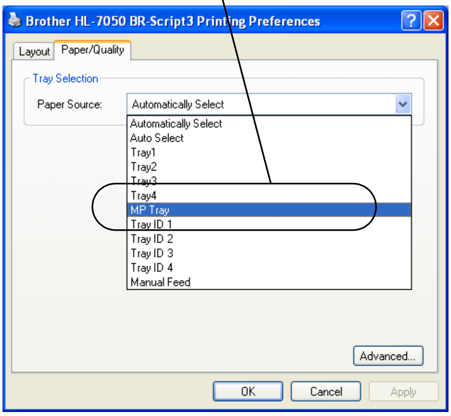


Select the Paper Size, Media Type and so on.

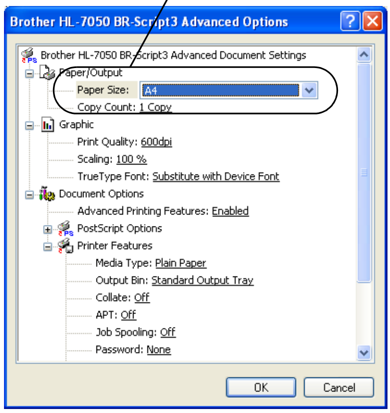
Select the MP Tray and so on.

<PS driver>

Select MP Tray.



Select the Paper Size.



Printing on envelopes (Face-up printing)

Types of envelopes to avoid

Do not use envelopes:

- that are damaged, curled, wrinkled, or an unusual shape
- that are extremely shiny or textured
- with clasps, snaps or tie strings
- with self-adhesive closures
- that are of baggy construction
- that are not sharply creased
- that are embossed (have raised writing on them)
- that were previously printed by a laser printer
- that are pre-printed on the inside
- that cannot be arranged when put in a pile
- that are made of paper that weighs more than the paper weight specifications for the printer
- that have been badly made, with edges that are not straight or consistently square or
- with windows, holes, cutouts or perforations.

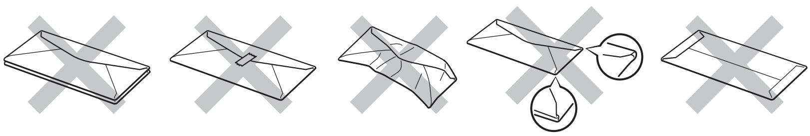


Figure 1-17

IF YOU USE ANY OF THE TYPES OF ENVELOPES LISTED ABOVE, THEY MAY DAMAGE YOUR PRINTER. THIS DAMAGE IS NOT COVERED UNDER ANY BROTHER WARRANTY OR SERVICE AGREEMENT.



- Before you print envelopes, you must 'fan' the stack to avoid paper jams and misfeeds.

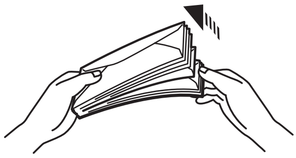


Figure 1-18

- Do not load different types of paper at the same time in the paper tray because it may cause paper jams or misfeeds.
- Do not print envelopes using duplex printing.
- For proper printing, you must choose the same paper size from your software application as the paper in the tray.
- If your application software does not allow you to select the paper size in its Print menu, you can use the control panel Menu buttons to go to the PAPER menu to change the paper size. *For more information, see Chapter 3*.

1 Open the multi-purpose tray and lower it gently.

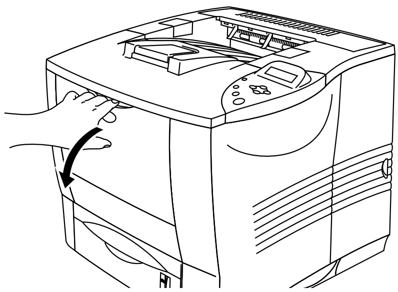


Figure 1-19

2 Pull out the multi-purpose support flap.

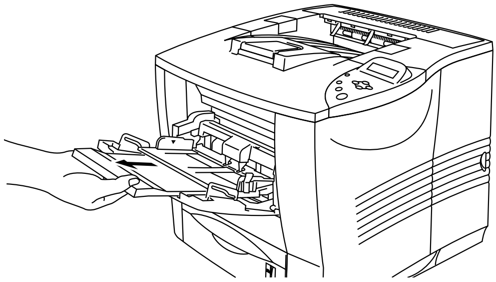


Figure 1-20

3 Open the face-up output tray, and then pull out the face-up output tray support if necessary.

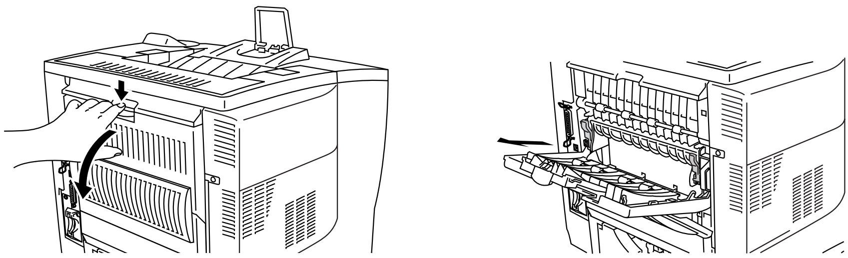


Figure 1-21

Envelopes that have been creased after they have been printed:
At the back of the printer open the face-up output tray and push down the blue tabs at the left-hand and right-hand sides (as shown in the figure below). When you have finished printing your envelopes, close the face-up output tray to reset the blue tabs automatically. To reset the blue tabs manually, push the blue tabs back to their original position.

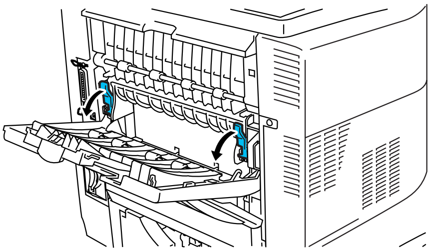


Figure 1-22

4 Put the envelopes in the multi-purpose tray so they touch the back of the tray and remain below the maximum paper mark (▼).

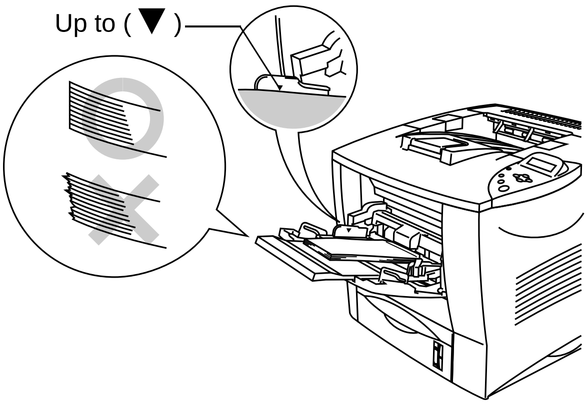


Figure 1-23

Make sure that the paper is neatly stacked and in the proper position on the multi-purpose tray. If it is not, the paper may not be fed properly, resulting in a skewed printout or a paper jam.

5 Press and slide the paper-width guide to fit the envelope size.

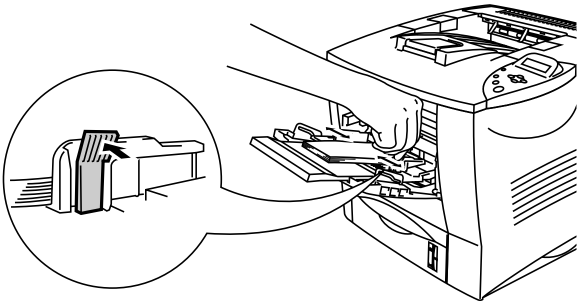


Figure 1-24

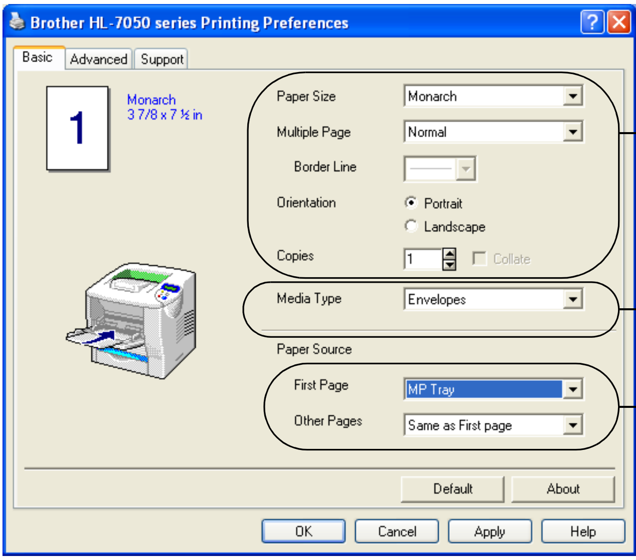


When you put paper in the multi-purpose tray, please remember the following:

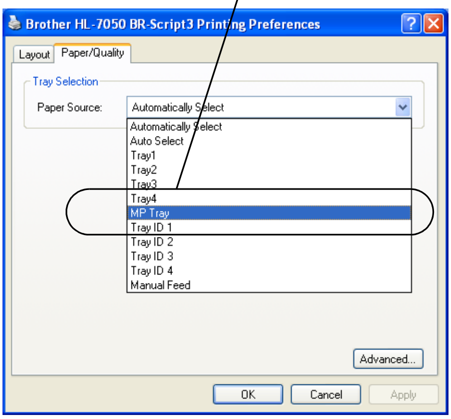
- The print surface must be face up.
- Put the leading edge of the paper in first and push it gently into the tray.
- The top of the paper stack must be under the maximum paper marks (▼) that are on both sides of the tray.

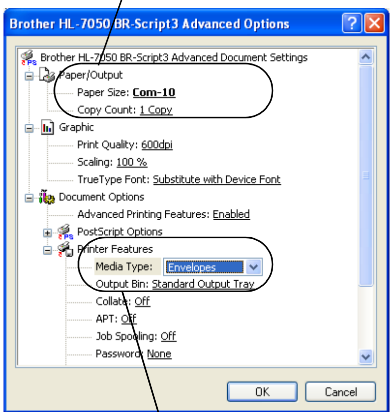
6 Change the following settings in the printer driver.

<PCL driver>



<PS driver>





- During printing, the inside tray rises to feed paper into the printer.
- If envelopes get smudged during printing, in the printer driver select MP Tray as the Paper Source for a straight paper path. Then, set the Media Type to Thick Paper or Thicker Paper to increase the fixing temperature. To adjust the print density setting, see Chapter 3.
- Envelope joints that are sealed by the manufacturer should be secure.
- All sides should be properly folded without any wrinkles or creases.

Most envelopes will be suitable for your printer. However, some envelopes will have feed and print-quality problems because of the way they have been made. A suitable envelope should have edges with straight, well-creased folds and the leading edge should not be thicker than two pieces of paper. The envelope should lie flat and not be of baggy or flimsy construction. You should buy quality envelopes from a supplier who understands that you will be using the envelopes in a laser printer. Before you print a lot of envelopes, test one to make sure that the print results are what you want.

Brother will not recommend a particular envelope because envelope manufacturers may change the envelope specifications. You are responsible for the quality and performance of envelopes you use.

Printing on labels, transparencies and other special paper

Types of special paper to avoid

- Do not use paper that is damaged, curled, wrinkled or an unusual shape.

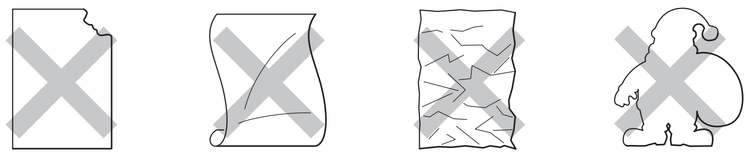


Figure 1-25

Before using paper that has holes in it, such as organizer sheets, you must 'fan' the stack to avoid paper jams and misfeeds.

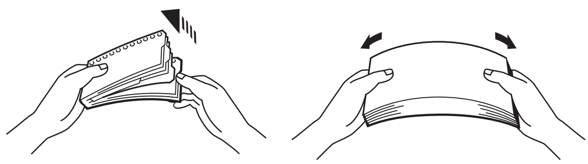


Figure 1-26

- Do not use paper with perforations (holes) at the edges.
- Do not put the punched holes near the actuator (paper sensor).
- Do not use organizer sheets that are stuck together. The glue that is used might damage the printer.
- Do not load different types of paper at the same time in the paper tray because it may cause paper jams or misfeeds.
- For proper printing, you must choose the same paper size from your software application as the paper in the tray.
- If your application software does not allow you to select the paper size in its Print menu, you can use the control panel Menu buttons to go to the PAPER menu to change the paper size. *For more information, see Chapter 3*.

1 Open the multi-purpose tray and lower it gently.

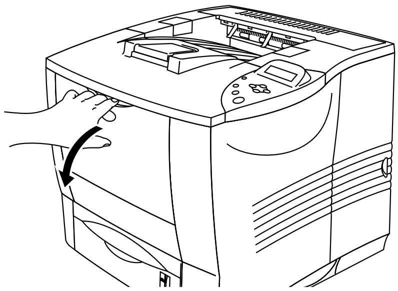


Figure 1-27

2 Pull out the multi-purpose support flap.

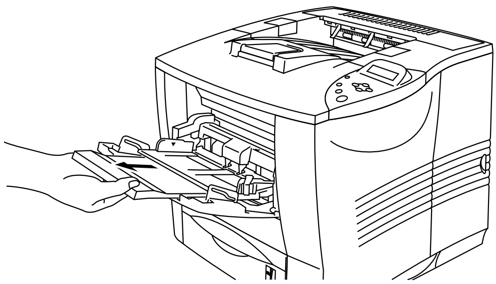


Figure 1-28

3 Open the face-up output tray.

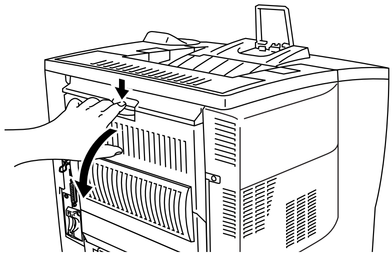


Figure 1-29



Pull out the face-up output tray support.

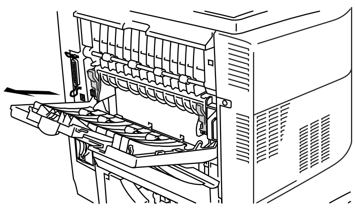


Figure 1-30

4 When you load paper in the multi-purpose tray, make sure it touches the back of the tray and remains below the paper guide (▼).

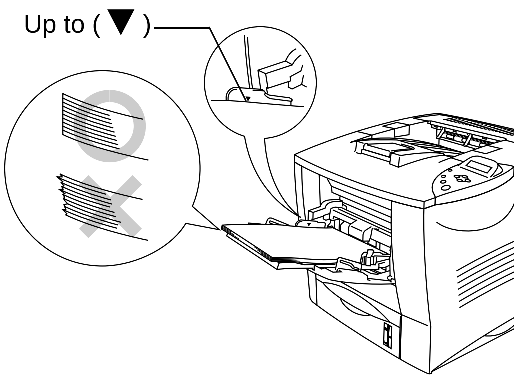


Figure 1-31

Make sure that the paper is neatly stacked and in the proper position on the multi-purpose tray. If it is not, the paper may not be fed correctly, resulting in a skewed printout or a paper jam.

5 While pressing the [blue] paper-guide release lever, slide the paper guide to fit the paper size.

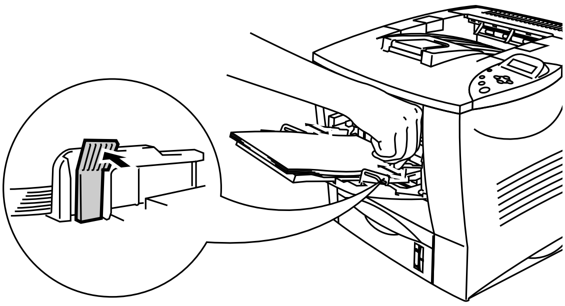


Figure 1-32

WARNING

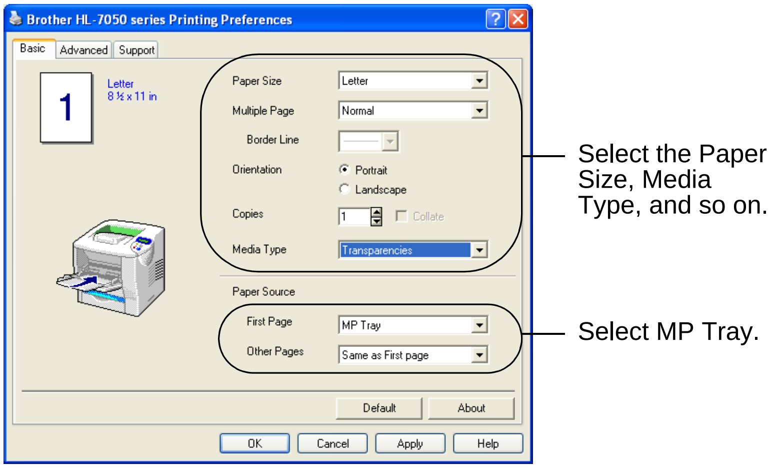
Do not touch transparencies that have just been printed because they will be very **hot**!

When you put paper in the multi-purpose tray, please remember the following:

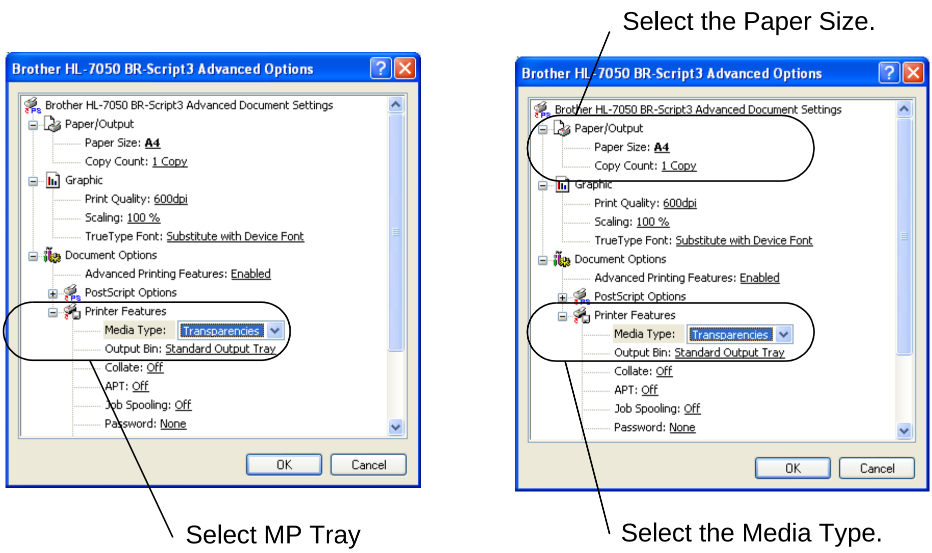
- During printing, the inside tray rises to feed paper into the printer.
- The print surface must be face up.
- Put the leading edge of the paper in first and push it gently into the tray.
- The top of the paper stack must be under the maximum paper marks that are on both sides of the tray.

6 Select the following setting in the printer driver.

<PCL driver>



<PS driver>



Printing to the face-up output tray (Face-up printing)

When the face-up output tray is open, the printer has a straight paper path from the paper tray or multi-purpose tray to the back of the printer. Use this method when you want to print on special media that is thick or should not be bent, such as thick paper, labels, card stock or envelopes.

1 Open the face-up output tray.

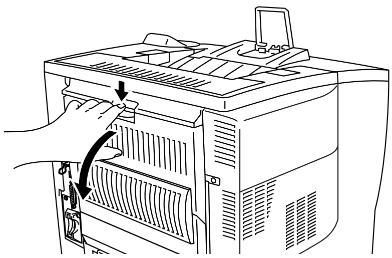


Figure 1-33

2 Pull out the face-up output tray support.

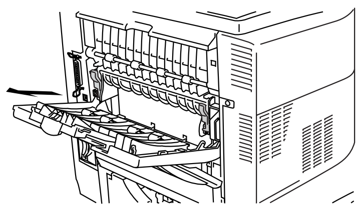


Figure 1-34

3 Put the paper in the paper tray or the multi-purpose tray.

4 After all the printed pages come out of the printer, remove them and close the face-up output tray.

Manual feed

If you put paper in the multi-purpose tray when the setting MANUAL FEED = ON has been set in PAPER menu using the control panel Menu buttons, the printer will only load paper from the multi-purpose tray.

When you feed paper manually, please remember the following:

- If your application software allows you to select manual feed in the Print menu, you can select it through the software. Since the software or command setting overrides the control panel button setting, you do not need to set the MANUAL FEED mode and the paper size in the PAPER menu.
- If you use pre-printed paper in the multi-purpose tray, you should put the top edge of the paper inside first with the pre-printed side face up.

2 Driver and software

Printer driver

A printer driver is software that translates data from the format used by a computer to the format that a particular printer needs. Typically, this format is a printer command language or page description language.

The printer drivers for the following operating systems are on the CD-ROM that we have supplied. You can also download the latest printer driver from the Brother Solutions Center at http://solutions.brother.com

	PCL Driver (Hewlett-Packard LaserJet compatible laser printer)	BR-Script Driver (Postscript® 3 language emulation)
Windows® 95/98/Me	ⓘ	ⓘ
Windows® 2000	ⓘ	ⓘ
Windows NT® 4.0	ⓘ	ⓘ
Windows® XP	ⓘ	ⓘ

	BR-Script Driver (Postscript® 3 language emulation)
Mac® OS 8.6-9.2 *Use the LaserWriter 8 Driver that we have supplied for your OS	ⓘ
Mac® OS X 10.1 *Use the PostScript® Driver that we have supplied for your OS	ⓘ

- If you want to print from a DOS application, see *Chapter 6*.
- For more information about emulations, see *Chapter 3*.
- When you print using a Network, you will need to have a Network board installed. Please see *Chapter 4*.

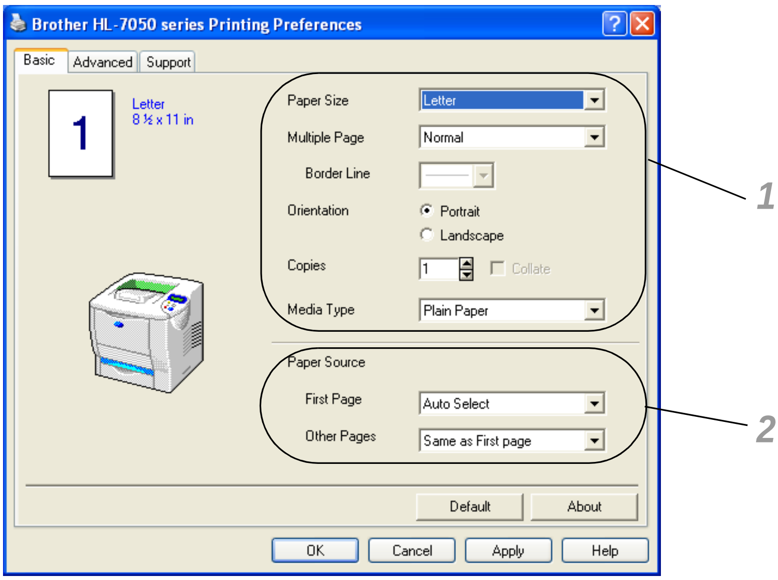
Features in the PCL printer driver (For Windows®)

You can download the latest driver or get other product information by accessing the Brother Solutions Center at http://solutions.brother.com

The screens in this section are from Windows® XP. The screens on your PC will vary depending on your Operating System.

Basic tab

If you are using Windows NT® 4.0, Windows® 2000 or XP, you can access the Basic tab by clicking Printing Preferences... in the General tab of the Brother HL-7050 series Properties screen.



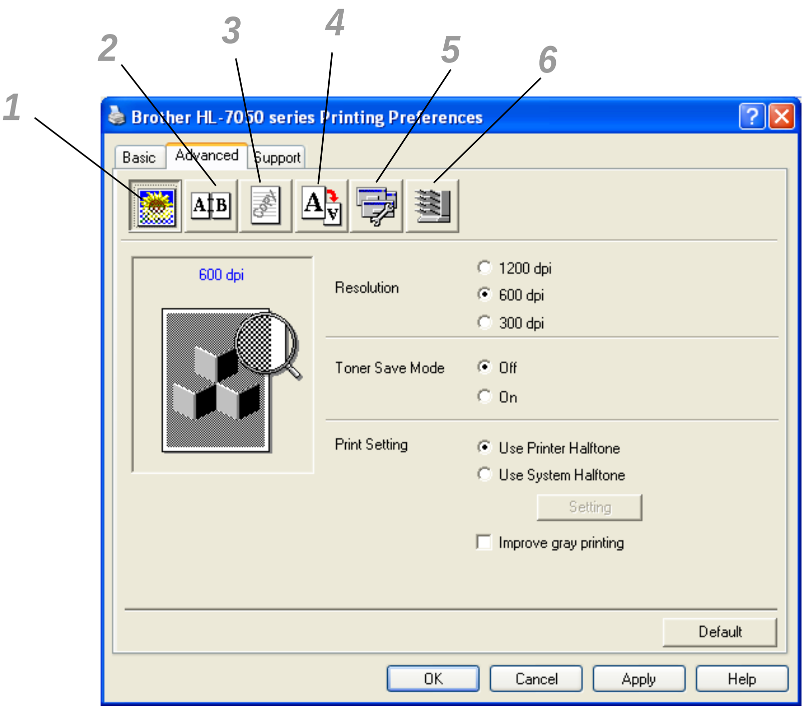
Change the settings for Paper Size, Multiple Page, Orientation and so on.

1 Select Paper size, Multiple page, Orientation (Portrait or Landscape), Copies and Media Type.

2 Select the Paper Source and so on.

Advanced tab

If you are using Windows NT® 4.0, Windows® 2000 or XP, you can access the Advanced tab by clicking Printing Preferences... in the General tab of the Brother HL-7050 series Properties screen.



Change the tab settings by clicking the following icons:

1. Print Quality
2. Duplex / Booklet Printing
3. Watermark
4. Page Setting
5. Device Options
6. Destination

Print Quality

Select the Resolution, Toner Save Mode and Print Settings.

- You can change the Resolution in the printer driver as follows:
  300 dpi
  600 dpi
  1200dpi

- Toner Save Mode
  You can save running costs by turning on the Toner Save Mode, which reduces the print density.

- Print Setting (Windows® 95/98/98SE/Me only)
  With the Print Setting set to Manual, you can change the Brightness, Contrast, Graphics Mode settings and TrueType mode options.

Duplex Printing

To use duplex printing, you need to install the optional Duplex unit onto your printer. If you click the Duplex icon, the dialog box for duplex settings will appear. There are six types of duplex print options available.

Booklet Printing (For PCL driver Only)

A Booklet Printing function can be used when the optional Duplex unit is installed. If you select the Duplex icon, the dialog box for duplex settings will appear so you can select from 2 types of booklet options.

Watermark

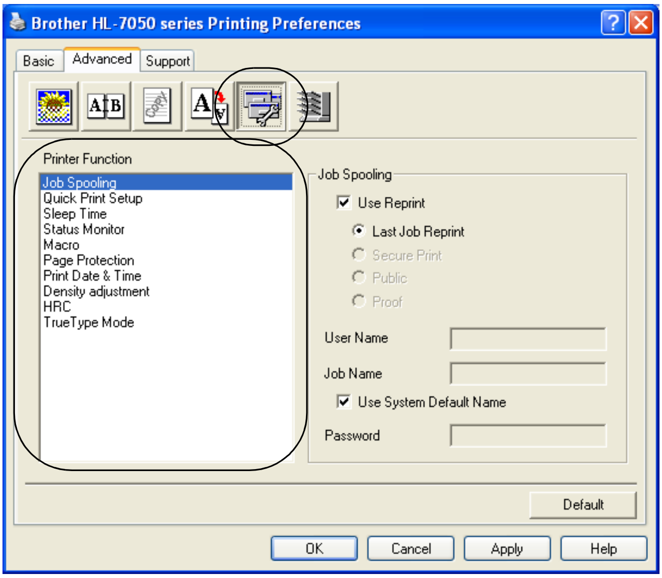
Select Use Watermark to put a watermark logo or text into your documents:

- When you use a bitmap file as a watermark, you can change the size of the watermark and put it anywhere you like on the page.
- When you use text as a watermark, you can change the font, darkness and angle settings.

Page Setting

You can change the Scaling of the print image and select Mirror Print and Reverse Print options.

Device Options



You can set the following Printer Function modes in this tab:

Jump to the page for each Printer Function by clicking the function name.

Job Spooling (*For more information, see Chapter 3*)
Quick Print Setup
Sleep Time
Status Monitor
Macro
Page Protection
Print Date & Time
HRC
TrueType Mode

Job Spooling

The printer saves data that you want reprinted.
You can reprint a document without sending the data again from your PC (except for Secure Printing).

- Last Job Reprint: Reprint the last job
- Secure Print: Print the data with a password
- Public: Save the data without a password
- Proof: Save the data and print it

For more information about the Reprint function, see *Reprint button in Chapter 3.*

If you want to prevent other people from printing your data using the Reprint function, clear the Use Reprint check box in the job spooling settings.

Quick Print Setup

You can turn the Quick Print Setup function ON or OFF. A small selection window appears on your computer, this will then let you make changes to the settings of the following functions:

- Multiple Page
- Duplex
- Toner Save Mode
- Paper Source
- Media Type

Sleep Time

When the printer does not receive data for a certain period of time (timeout), it enters sleep mode. Sleep mode acts as though the printer was turned off. The default timeout is 5 minutes and it is automatically adjusted to the most suitable time-out setting depending on the frequency of your printer use (Intelligent Sleep Mode). While the printer is in sleep mode, the light on the display is off, but the printer can still receive data from the computer. Receiving a print file or document automatically wakes up the printer to start printing. Pressing one of the buttons will also wake up the printer.

Status Monitor

This reports the page number and printer status (any errors that occur on the printer) during printing. If you do not need the Printer Status and would like to speed up your job, set the Printer Status to OFF.

Macro

You can save a page of a document as a macro to printer memory or optional device. Moreover, you can execute the saved macro - in other words, you can use the saved macro as an overlay on any documents. This will save time and increase printing speed for often used information such as forms, company logos, letter head formats or invoices.

Page Protection

'Page Protection' refers to a setting that reserves additional memory for the creation of full page images.
Selections are AUTO, OFF, LTR (Letter-size paper), A4 or LGL (legal-size-paper).
The page protection feature allows the printer to create the full page image to be printed in memory before physically moving the paper through the printer. When the image is very complicated and the printer has to wait to process the image before printing, use this function.

Print Date & Time

Date: Specifies the format of the date.
Time: Specifies the format of the time.

HRC

This option allows you to change the HRC setting on your Brother HL-7050 series printer. HRC is a special function that offers improved print quality of characters and graphics that conventional laser printers cannot attain with resolutions of 300 or 600 dpi.

- Printer Default: The setting will match that of the printer.
- On: Turn HRC on
- Off: Turn HRC off

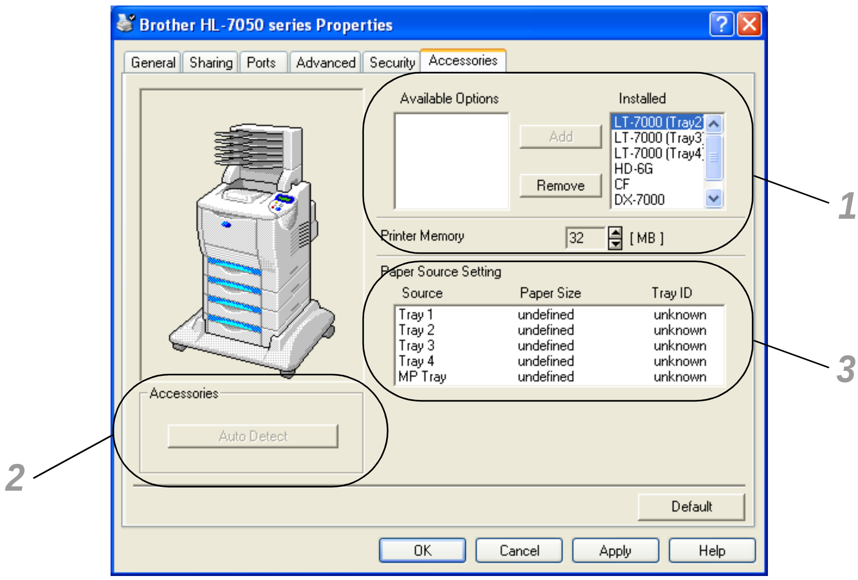
TrueType Mode

TrueType fonts may be sent to your printer in one of the following ways:

Download as TrueType
Download as Bit Image
Print as Graphics

Accessories tab

When you install the optional units, you can add those options and select their settings in the Accessories tab as follows.



1 You can manually add and remove the options for any optional unit device that is installed on the printer. Tray settings will match the installed options.

2 Auto detection of printer options
The Auto Detect function finds the currently installed optional unit devices and shows the available settings in the printer driver. When you click the Auto Detect button, options that are installed on the printer will be listed. You can manually add or remove options. Tray and other settings will match the installed options.

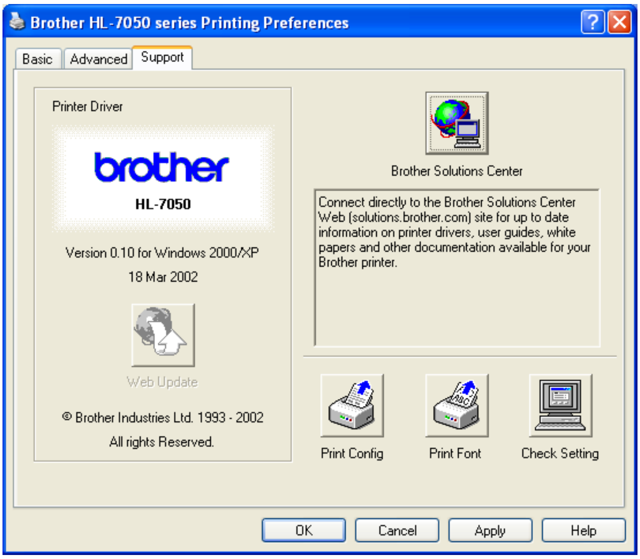
Auto Detect function is not available under certain printer conditions.

3 Paper Source Setting
This feature automatically knows the size of paper in each paper tray.

Support tab

If you are using Windows NT® 4.0, Windows® 2000 or XP, you can access the Support tab by clicking Printing Preferences... in the General tab of the Brother HL-7050 series Properties screen.

- You can download the latest driver by accessing the Brother Solutions Center at http://solutions.brother.com
- You can see the printer driver version.
- You can check the current driver settings.
- You can print the Configuration page (Print Settings) and the internal fonts list.



Features in the PS printer driver (For Windows®)

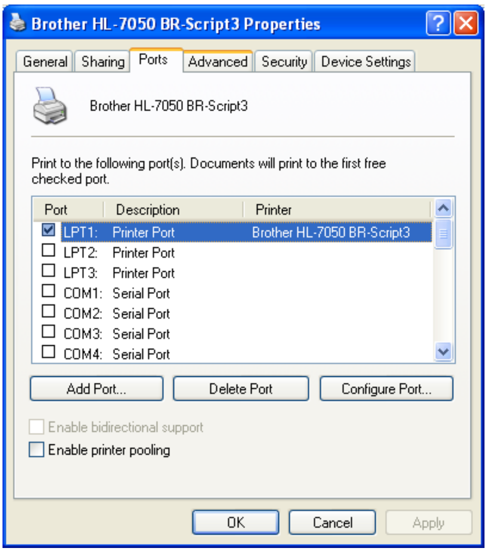
You can download the latest driver by accessing the Brother Solutions Center at http://solutions.brother.com

For more information, please see the online Help in the printer driver.

The screens in this section are from Windows® XP.
The screens on your PC will vary depending on your Operating System.

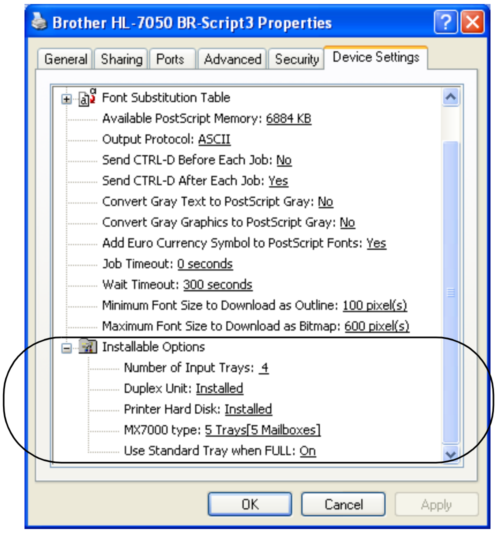
Ports tab

Select the port where your printer is connected or the path to the network printer you are using.



Device Settings tab

Select the options you installed.

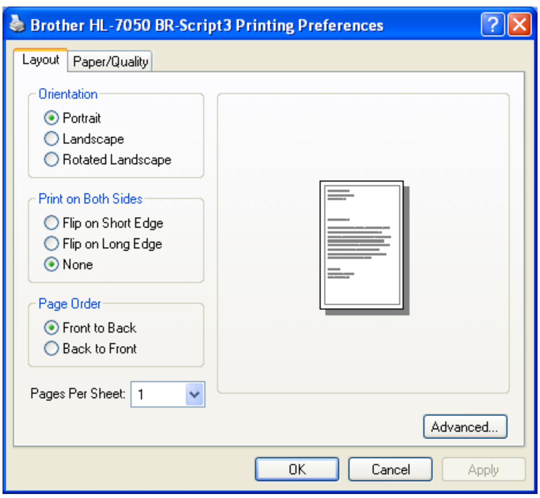


Layout tab



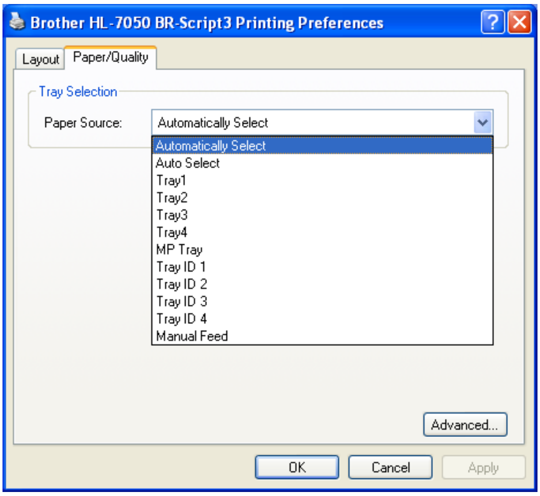
If you are using Windows NT® 4.0, Windows® 2000 or XP, you can access the Layout tab by clicking Printing Preferences... in the General tab of the Brother HL-7050 BR-Script3 Properties screen.

You can change the Layout setting by selecting the setting in the Orientation, Print on Both Sides, Page Order and Page Per Sheet.



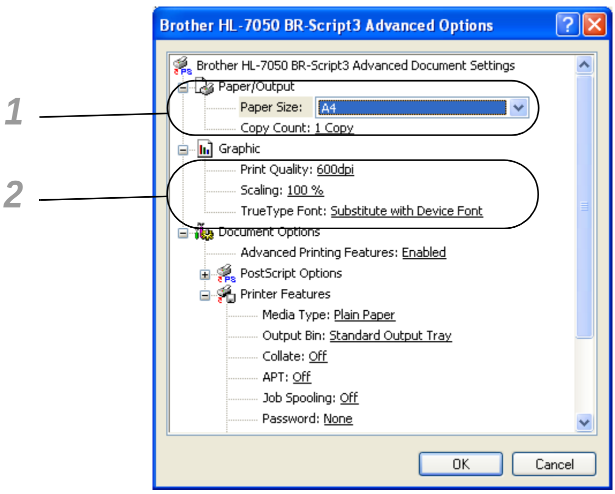
Paper / Quality tab

Select the paper source.



Advanced Options

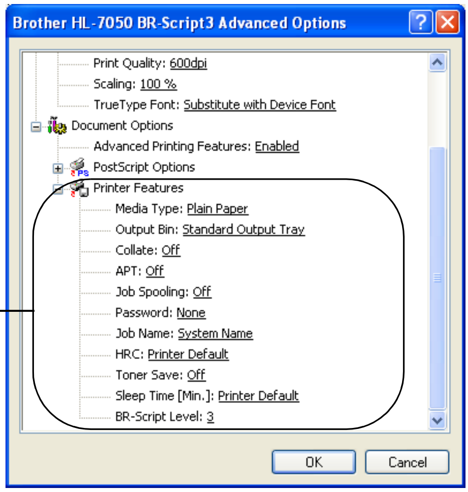
If you are using Windows NT® 4.0, Windows® 2000 or XP, you can access the Brother HL-7050 BR-Script3 Advanced Options tab by clicking Advanced... button in the Layout tab or the Paper / Quality tab.



1 Select the Paper Size and Copy Count.

2 Set the Print Quality, Scaling and TrueType Font setting.

3



3 You can change settings by selecting the setting in the Printer Features list:

Media Type
Output Bin
Collate
APT
Job spooling (You will need to set the RAM Disk size first. *For more information, see Chapter 3*.)
Password
Job Name
HRC
Toner Save
Sleep Time
BR-Script Level

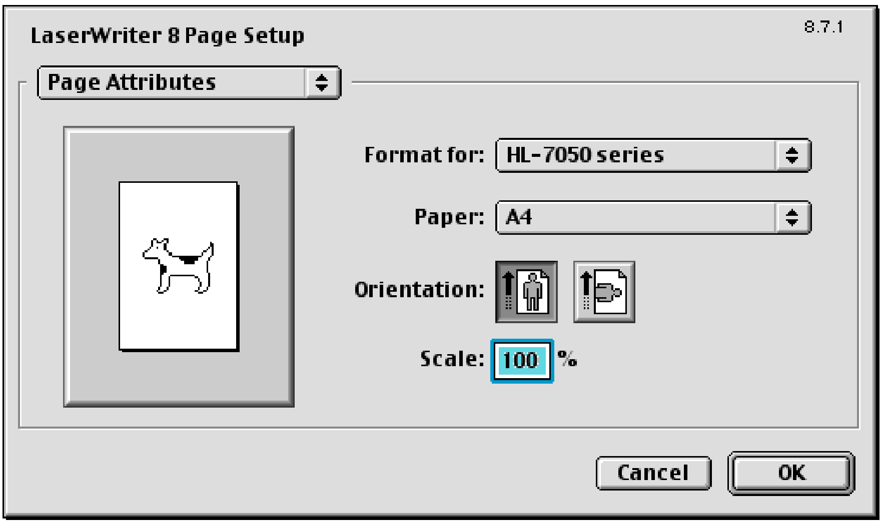
Features in the PS Printer driver (For Mac® OS 8.6 to 9.2 / Mac® OS X 10.1)

You can download the latest driver by accessing the Brother Solutions Center at http://solutions.brother.com

The screens in this section are from Laser Writer 8 of Mac® OS 9.0.
The screens on your PC will vary depending on your Operating System.

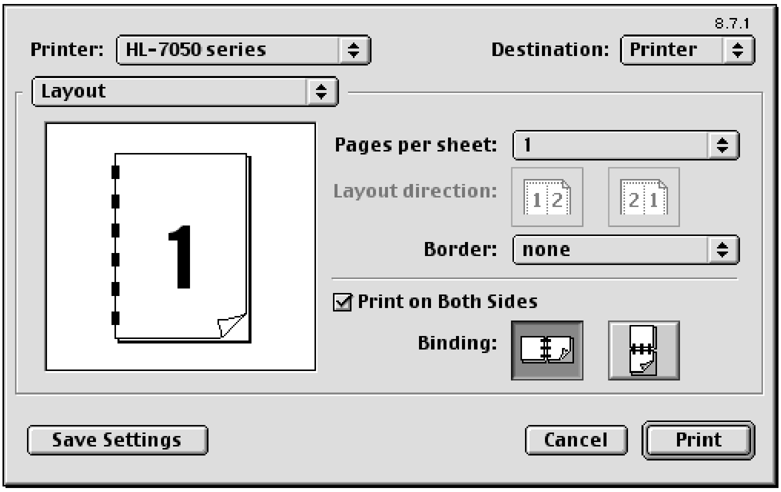
Page setup

You can set the Paper size, Orientation and Scale.



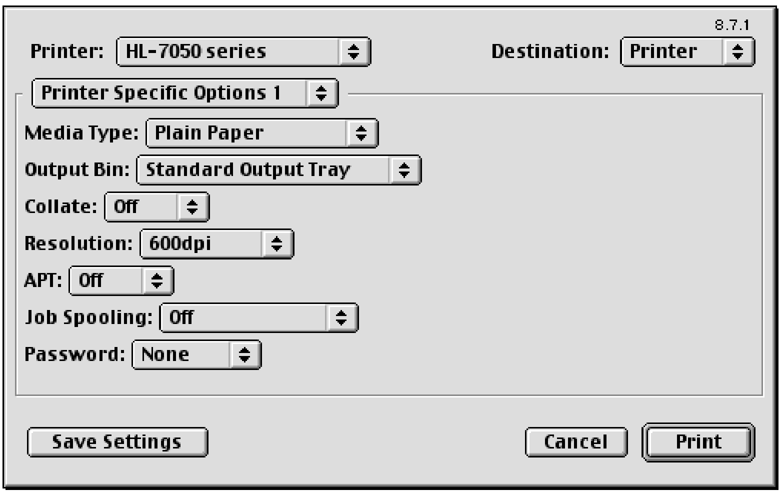
Layout

Set the layout, Pages per sheet and so on.



Specific options

Set the Media Type, Resolution, secure printing, and so on.



Software for networks

Web Browser Management

Many Brother printers support Embedded Web Server (EWS) technology. This means that you can use a standard web browser to manage many aspects of the printer; for example, you can view consumable life, configure network parameters, view serial number information, printer usage, and so on. Start your web browser and enter the NetBIOS name, DNS name or IP address of the printer.

(Windows® only)

BRAdmin Professional

The BRAdmin Professional software is designed to manage your Brother network connected devices, such as our network ready printers and multifunction centers. BRAdmin Professional can also manage other manufacturers' products that support SNMP (Simple Network Management Protocol).

Driver Deployment Wizard

This installer includes the Windows® PCL driver and Brother network port driver (LPR and NetBIOS). The administrator should set up the IP address, Gateway and Subnet with BRAdmin Professional before using this software.
If the administrator then installs the printer driver and port driver using this software, he can save the file to the File server or send the file in E-mail to users. Then, each user just clicks that file to have the printer driver, port driver, IP address, and so on, automatically copied to their PC.

Web BRAdmin

The Web BRAdmin software is designed to manage all LAN/WAN Brother network connected devices. By installing the Web BRAdmin server software on a computer running IIS*, Administrators with a Web browser can connect to the Web BRAdmin server, which then communicates with the device itself. Unlike the BRAdmin Professional software - which is designed for Windows® systems only - the Web BRAdmin server software can be accessed from any client computer with a web browser that supports Java.

IIS* = Internet Information Server 4.0 or 5.0

Web BRAdmin and Internet Information Server 4.0 is supported on the following operating systems:

- Windows NT® 4.0 Workstation
- Windows NT® 4.0 Server

Web BRAdmin and Internet Information Server 5.0 is supported on the following operating systems:

- Windows® 2000 Professional
- Windows® 2000 Server
- Windows® 2000 Advanced Server
- Windows® XP Professional3

Software installation for Windows®

You can install the Software from the CD-ROM that we have supplied as follows:

1. Insert the CD-ROM into the CD-ROM drive. The opening screen appears automatically.
   If the screen does not appear, click Start and select Run, and then enter the CD drive letter and type \START.EXE (for example: D:\START.EXE).

2. Select your language, and then follow the instructions on the screen. The printer driver will complete the installation.

Software installation for Macintosh®

This printer supports Mac® OS version 8.6 to 9.2 and Mac® OS X 10.1 or later.

Apple LaserWriter 8 driver

The Apple LaserWriter Driver may have been installed with your system. If it is not, it is available at http://www.apple.com

LaserWriter 8 versions 8.6 and 8.7 have been tested for use with this printer.

PostScript Printer Description files (PPDs)

PPDs, in combination with the Apple LaserWriter 8 driver, access the printer features and allow the computer to communicate with the printer. There is an installation program for the PPDs (BR-Script PPD Installer) on the CD-ROM.

Automatic Emulation Selection

This printer has an Automatic Emulation Selection feature. When the printer receives data from the computer, it automatically chooses the emulation mode. This feature has been set at the factory to ON.

The printer can choose from the following combinations:

EPSON (default)	IBM
HP LaserJet BR-Script 3 HP-GL EPSON FX-850	HP LaserJet BR-Script 3 HP-GL IBM Proprinter XL

You can select the emulation mode manually by using the control panel Menu buttons to go to the SETUP menu to change the EMULATION. *For more information, see Chapter 3*.

When you use the Automatic Emulation Selection, please remember the following:

- You must select the EPSON or IBM emulation mode priority because the printer cannot tell the difference between them. Since the factory setting is the EPSON emulation mode, you might need to select the IBM emulation mode by using the control panel Menu buttons to go to the SETUP menu to change the EMULATION.
- Try Automatic Emulation Selection with your application software or network server. If it does not work properly, select the emulation mode manually using either the printer control panel buttons or the emulation selection commands from your software.

Automatic Interface Selection

This printer has an Automatic Interface Selection feature. When the printer receives data from the computer, it automatically selects the interface that is appropriate.

When you use the parallel interface, you can turn the high-speed and bi-directional communications ON or OFF by using the control panel Menu buttons to go to the INTERFACE menu. *For more information, see Chapter 3*. Since the Automatic Interface Selection feature has been set at the factory to ON, simply connect the interface cable to the printer.

When you use the serial interface, you need to have the same communications settings on both the printer and the computer. Since the Automatic Interface Selection feature has been factory set, you may be able to simply connect the interface cable to the printer if your computer has the settings listed below.

Communications parameters	**Factory settings**
Baud rate (Data transfer speed)	9600
Code type (Data length)	8 bits
Parity (Data error check)	None
Stop bit (Data separator)	1 stop bit
Xon / Xoff (Handshake protocol)	ON
DTR (ER)	ON
Robust Xon	OFF

If a network board (Brother NC-4100h) has been installed, use the control panel to select NETWORK.

When necessary, use the control panel in the INTERFACE menu to select the interface or the serial communications parameters manually. *For more information, see Chapter 3*. For the computer settings, see the manual for the computer or software you are using.

When you use the Automatic Interface Selection, note the following:

- This function takes a few seconds to work. If you want to speed up printing, select the required interface manually in the SELECT menu by using the control panel in the INTERFACE menu.

If you constantly use only one interface, we recommend that you select that interface as the default setting in the INTERFACE menu. The printer allocates the entire input buffer to that interface when only one interface is selected.

Printer settings

Factory settings

The printer settings have been preset at the factory and they are called "Factory settings." Although you can use the printer without changing these factory settings, you can tailor the printer to your particular needs by changing the 'user settings.' See *List of factory settings in Chapter 3.*

You can reset the changed user settings to the factory settings in the RESET menu. *For more information, see Chapter 3*.

3 Control panel

Control panel



Figure 3-1

Buttons

You can control the basic printer operations and change various printer settings with seven buttons (**Go**, **Job Cancel**, **Reprint**, **+**, **-**, **Set**, **Back**).

Button	Operation
Go	Exit from the control panel menu, reprint settings and error messages. Pause and continue printing.
Job Cancel	Stop and cancel the printing job in progress.
Reprint	Select the number of extra copies (1-999).
+	Move forward through menus. Move forward through the options you can choose.
-	Move backward through menus. Move backward through the options you can choose.
Set	Select the control panel menu. Set the selected menus and settings.
Back	Go back one level in the menu.

Go button

You can change the panel indications from the current status (Menu, Error and Reprint settings) by pressing the **Go** button once. For ERROR indications, the control panel only changes when the error is cleared.

You can pause printing with the **Go** button. Pressing the **Go** button again restarts the print job and clears the pause. During a pause, the printer is off-line.

If the printer is in PAUSE mode and you do not want to print the remaining data, you can cancel the job by pressing the **Job Cancel** button. Once the job has been cancelled the printer will return to the READY state.

Job Cancel button

You can cancel the processing or printing of data with the **Job Cancel** button. The display shows JOB CANCELLING until the job is cancelled. After cancelling the job, the printer returns to the READY state.

When the printer is not receiving data or printing, the display shows `NO DATA!!!` and you cannot cancel the job.

Reprint button

If you want to reprint a document that has just been printed, you can reprint it by pressing the **Reprint** button. Also, if you have created a document that you wish to share with colleagues, simply spool the document to a non-secure area of the printer. This document can then be reprinted by anyone who is on the network or at the printer control panel.

You can use the **Reprint** button when the printer is in READY or PAUSE state.

If you want to print PROOF, PUBLIC or SECURE data, we recommend that you install the optional hard disk drive (HDD) or CompactFlash card.

If you do not install an HDD (see *Hard disk drive (HD-EX) in Chapter 4.*) or CompactFlash card (see *CompactFlash card in Chapter 4.*), you can reprint from random access memory (RAM). The reprint data in RAM will be deleted when the printer is turned off.

When you use RAM to reprint:

1. Press the **Set** button on the control panel to exit from the READY state and select RAMDISK SIZE in the SETUP menu.

2. The present RAM disk is 0MB. Press the **+** button to increase the reprint RAM size in increments of 1MB.

- When you increase the RAM size for Secure Printing, the work area of the printer is decreased and the printer performance will be reduced. Make sure that you reset the Ramdisk size to 0MB after you finish using Secure Printing.
- When you store data in RAM, the data will be deleted when the printer is turned off.

We recommend that you add more RAM if you want to be able to print a lot of secure data. (see *RAM expansion in Chapter 4.*)

Reprinting the last job

You can reprint the data from the last print job without sending it from the computer again.

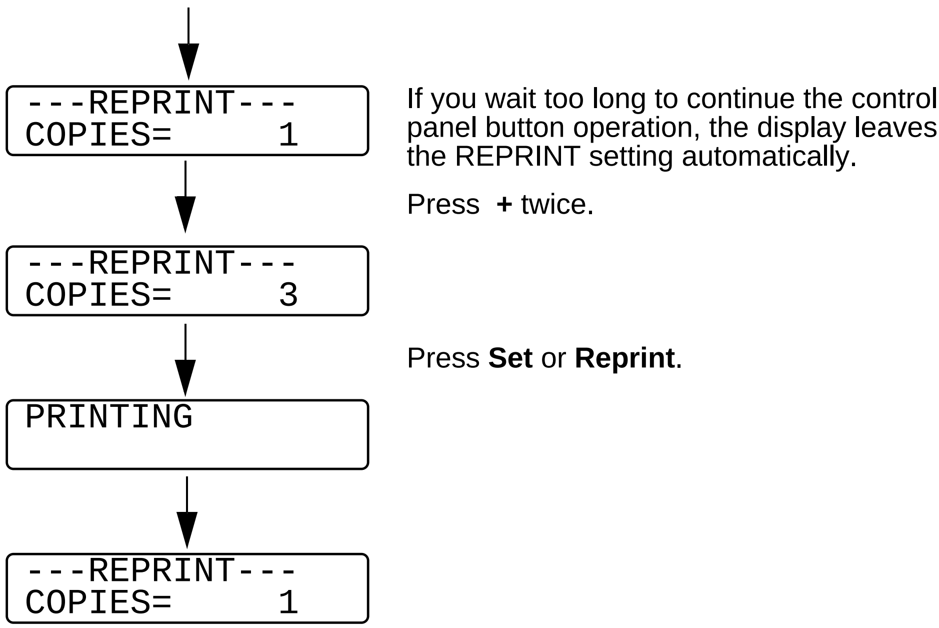
- If REPRINT function is set to OFF on the control panel and you press the **Reprint** button, the LCD shows NO DATA STORED for a short time.
- If you want to cancel reprinting, press the **Job Cancel** button.
- If the printer does not have enough memory to spool the print job data, it will only print the last page.
- Pressing the **-** or **+** button makes the number of reprint copies decrease or increase. You can select between 1 and 999 COPIES.
- For more information about the settings in the printer driver, see *Job Spooling in Chapter 2.*

Reprint the last job three times

1 Turn the REPRINT function ON by using the control panel buttons to go to the SETUP menu.

> If you print using the driver we have supplied with the printer, the settings for Job Spooling in the printer driver will take priority over the settings made on the control panel. For more information, see *Job Spooling in Chapter 2.*

2 Press the **Reprint** button.



- If you press the **Go** button twice, the printer will leave the REPRINT setting.
- If you want to reprint the data and have pressed the **Go** button, the display shows PRESS SET TO PRINT. Press the **Set** or **Reprint** button to start reprinting, or press **Go** again to cancel the reprint job.

Printing PROOF data

You can use this function to reprint PROOF data that has just been printed and has no security settings. Documents that are placed in the PROOF area are available to anyone. You might use this function for a document that will be moved to a public folder at a later date.

When the area to spool data is full, the earliest data is automatically deleted first. The order of deleting data is not connected to the order of reprinting.

When you reprint PROOF data, please see *How to print SECURE data* in this chapter.

- If you have not installed the optional HDD (hard disk drive) or CompactFlash, the reprint data will be deleted when the printer is turned off.
- If there is data in the job information that cannot be displayed on the LCD, the display shows '?'.
- For more information about the settings in the printer driver, see *Job Spooling in Chapter 2.*

Printing PUBLIC data

You can use this function to reprint documents that are stored in a PUBLIC area of the printer memory. Documents here will not be protected by a password and anyone can access them using the front panel or a web browser. The printer will not print a PUBLIC document when you send it to the printer. You must use the control panel of the printer or connect to the printer through a web browser.

PUBLIC data can be deleted using the control panel of the printer or from the web-based management software.

When you reprint PUBLIC data, please see *How to print SECURE data* in this chapter.

- If there is data in the job information that cannot be displayed on the LCD, the display shows a '?'.
- For more information about the settings in the printer driver, see *Job Spooling in Chapter 2.*

Printing SECURE data

SECURE documents are protected by a password and only those people who know the password will be able to print the document. The printer will not print the document when you send it for printing. To print the document you must use the control panel of the printer (with the password) or connect to the printer using a web browser.

If you want to delete the spooled data, you can carry out this operation using the control panel or the web-based management software.

- If there is data in the job information that cannot be displayed on the LCD, the display shows '?'.
- For more information about the settings in the printer driver, see *Job Spooling in Chapter 2.*

How to print SECURE data

Press the **Reprint** button

If there is no data. →
```
NO DATA STORED
```

↓
```
--REPRINT--
LAST JOB
```
↓ Press **+** or **-**.
```
--REPRINT--
SECURE FILE
```
↓ Press the **Set** button.
```
SECURE FILE
USER   XXXXXX
```
↓ Press the **+** or **-** button to select the user name.
Press the **Set** button to set the user name.
```
USER XXXXXX
JOB  XXXXXX
```
↓ Press the **+** or **-** button to select the job.
Press the **Set** button to set the job.
```
JOB XXXXXXX
PASS NO.=0000
```
↓ Type your password.
Press the **Set** button to set the password
```
--REPRINT--
COPIES=       1
```
→ The printer will exit this menu after a time-out period.

↓ Press the **Set** button or the **Reprint** button.
If you press the **Go** button, the display shows `PRESS SET TO PRINT`.
```
PRINTING
```

When there is no reprint data in memory

If the printer does not have reprint data in the memory and you press the **Reprint** button, the LCD shows `NO DATA STORED`.

To cancel the reprint job

Pressing the **Job Cancel** button allows you to cancel the current reprint job. The **Job Cancel** button also allows you to cancel a paused reprint job.

+ or - button

If you press the **+** or **-** button when the printer is on-line (READY), it goes off-line and the LCD displays the menu.

To move through menus on the LCD

If you press the **+** or **-** button when the printer is the on-line (READY), it goes off-line and the LCD displays the current mode.

You can go to other menus by pressing the **+** or **-** button. Pressing the **+** or **-** button allows you to move forward or backward through the menus and settings on the display. Press or keep pressing the button until you see the setting you want.

To enter numbers

You can enter numbers in two ways. You can press the **+** or **-** button to move up or down one number at a time, or you can hold down the **+** or **-** button to move faster. When you see the number you want, press the **Set** button.

Set button

If you press the **Set** button when the printer is the on-line (READY), it goes off-line and the LCD goes to the menu.

Pressing the **Set** button allows you to choose the displayed menu or option. After changing a setting, an asterisk (*****) appears briefly on the right-hand side of the message.

Back button

If you press the **Back** button when the printer is on-line (READY), it goes off-line and the LCD goes to the menu.

Pressing the **Back** button allows you to return to the previous level from the current menu level.

The **Back** button also allows you to choose the previous digit while setting numbers.

When you select a setting and it does not have and asterisk (**Set** button was not pressed), the **Back** button allows you to return to the previous menu level with the original setting unchanged.

When you press the **Set** button to choose a setting, an asterisk appears briefly at the end of the display. Since the asterisk shows what you have chosen, you can easily see the current settings as you look through the display.

Light-emitting diode (LED)

The LED is a light that shows the printer status.

Data - Orange LED

LED indication	Meaning
On	Data is in the printer memory.
Blinking	Receiving or processing data.
Off	No data left in the memory.

Liquid Crystal Display (LCD)

The display shows the current printer status. When you use the control panel buttons, the display will change.

If you take the printer off-line, the display changes to show the emulation you have chosen.

If there are any problems, the display shows the appropriate error message, maintenance message or call service message so you will know that you need to take action. For more information about these messages, see *Troubleshooting in Chapter 6.*

Back light

Light	Meaning
OFF	The printer is off-line or in sleep status.
Green (General)	Ready to print Printing Warming Up
Red (Error)	There is a problem with the printer.
Orange (Setting)	Choosing a menu Setting Reprint times Pause

LCD message

You can choose the message that is displayed on the second line of the LCD as shown below.

Select `NONE`, `PAGE COUNTER` or `JOB NAME` in the lower LCD setting of the SETUP menu.

```
READY
```

```
READY
JOB NAME
```

```
READY
PAGE = XXXX
```

Printer status messages

The following table shows the printer status messages that are displayed during normal operation:

Printer Status Message	Meaning
READY	Ready to print.
PROCESSING	Busy processing data.
SLEEP	In Sleep state
PRINTING	Printing.
PROGRAMING-WAIT	Accessing CompactFlash card or HDD.
SELF TEST	Performing self-diagnostics.
PAUSE	The printer has suspended its functions. Pressing the **Go** button starts the printer again.
NOW INITIALIZING	The printer is setting up.
WARMING UP	The printer is warming up.
RAM SIZE=XX MB	This printer has XX MB memory.
JOB CANCELLING	Cancelling the job.
RESOLUTION ADAPT	Printing with reduced resolution.
PRESS SET TO PRINT	Press the **Set** button to start printing.
RESET TO FACTORY SETTING	The printer setting returns to the factory settings.
FAX SENDING	Sending fax data (Please see http://solutions.brother.com for information about fax mode.)
FAX RECEIVING	Receiving fax data (Please see http://solutions.brother.com for information about the fax mode.)

How to use the control panel

When you operate the Menu buttons (**+**, **-**, **Set** or **Back**), remember the following basic steps:

- If no control panel operations are performed for 30 seconds, the LCD automatically returns to READY.
- When you press the **Set** button to choose a setting, an asterisk appears at the end of the display for a short time. After that, the display returns to the previous menu level.
- After changing the status or a setting, pressing the **Back** button before you press the **Set** button will cause the display to return to the previous menu level with the original settings unchanged.
- There are two ways to input numbers. You can press **+** or **-** to scroll up or down one number at a time, or you can hold down **+** or **-** to scroll faster. The blinking number is the one that you can change.

For example: When you want to turn the MP FIRST setting ON

The default setting is OFF. Turn this setting ON if you want to.

```
READY
```

Press any of the Menu buttons (**+**, **-**, Set or Back) to turn the printer off-line.

```
--MENU--
INFORMATION
```

Press the **+** or **-** button to move forward or backward through the menus.

```
--MENU--
PAPER
```

Press the **Set** button to move to the next menu level.

```
PAPER
SOURCE
```

Press the **+** or **-** button.

```
PAPER
MP FIRST
```

Press the **Set** button.

```
MP FIRST
=ON             *
```

Press the **+** button.

```
MP FIRST
=OFF
```

Press **Set** button.
An asterisk * briefly appears at the end of the display.
The default setting is indicated by an *

```
MP FIRST
=OFF            *
```

Control Panel LCD menu

The control panel LCD names for the paper trays are as follows.

Paper tray	TRAY 1
Multi-purpose tray	MP TRAY
Optional lower tray	TRAY 2, TRAY 3, TRAY 4
Optional Duplex unit for Duplex printing	DX
Optional Mailbox unit	MX

There are eight menus. For more information about the selections available in each menu, please see the pages listed below.

- **INFORMATION**
  For more information, see page 3-23.

- **PAPER**
  For more information, see page 3-24.

- **QUALITY**
  For more information, see page 3-24.

- **SETUP**
  For more information, see page 3-25.

- **PRINT MENU**
  For more information, see page 3-27.

- **NETWORK**
  For more information, see page 3-31.

- **INTERFACE**
  For more information, see page 3-32.

- **RESET MENU**
  For more information, see page 3-33.

INFORMATION

Display Shows	Description		
PRINT SETTINGS	Prints the print settings page.		
PRINT TEST	Prints the test page.		
PRINT DEMO	Prints the demonstration sheet.		
PRINT FILE LIST	Prints the card list.		
PRINT FONTS	Prints the font list and samples.		
CLEANING PAGE	Print the cleaning page to clean the thermistor.		
VERSION	**Subsetting**	**Description**	
	SER.NO=#########	Shows Printer serial number.	
	ROM VER=####	Shows ROM version.	
	ROM DATE=##/##/##	Shows ROM date.	
	NET VER=####	Shows Network version (only Network users).	
	NET DATE=##/##/##	Shows Network build date (only Network users).	
	RAM SIZE=###MB	Shows the size of memory in this printer.	
MAINTENANCE	PAGE COUNTER	=######	Shows the current total printed pages.
	DRUM COUNT	=######	Shows the pages printed with drum unit.
	REMAIN DRUM	=######	Shows the pages left to print with drum unit.
	REMAIN PF KIT MP	=######	Shows the pages left to print with PF kit MP.
	REMAIN PF KIT 1	=######	Shows the pages left to print with PF kit 1.
	REMAIN PF KIT 2	=######	Shows the pages left to print with PF kit 2.
	REMAIN PF KIT 3	=######	Shows the pages left to print with PF kit 3.
	REMAIN PF KIT 4	=######	Shows the pages left to print with PF kit 4.
	REMAIN FUSER	=######	Shows the pages left to print with fuser unit.
	REMAIN LASER	=######	Shows the pages left to print with laser unit.

PAPER

Display Shows	Description
SOURCE	=AUTO/MP/TRAY 1/TRAY 2/TRAY 3/TRAY 4 Select which paper tray the paper will be fed from.
PRIORITY	=MP>T1>T2>T3>T4* MP>T4>T3>T2>T1 T1>T2>T3>T4>MP T4>T3>T2>T1>MP
MP FIRST	=ON/OFF Select whether to feed paper from the MP tray as a priority.
MP SIZE	=ANY/LETTER/LEGAL/A4... Select the size of paper you loaded in the MP tray, for example, A4/Letter/ Legal/...
MANUAL FEED	=OFF/ON Select whether or not you want to feed paper manually.
DUPLEX	=OFF/ON(LONG BIND)/ON(SHORT BIND) Select whether you want to automatically print on both sides of the paper.
OUTPUT	=STANDARD/MAILBOX1-10/MX STACK/ MX SORT Select where you want the printed pages to go.

QUALITY

Display Shows	Description
RESOLUTION	=300/600/1200 You can select a print resolution of 300, 600 or 1200 dpi (dots per inch).
HRC	=OFF/LIGHT/MEDIUM/DARK HRC: High Resolution Control (HRC) offers improved print quality of letters, numbers and graphics that conventional laser printers cannot achieve, with a resolution of 300 or 600 dpi.
TONER SAVE	=OFF/ON
DENSITY	=-2:0:2 Increase or decrease the print density.

SETUP

Display Shows	Description	
LANGUAGE	= ENGLISH /FRANÇAIS /...	
PANEL CONTROL	**Subsetting**	**Description**
	LOWER LCD	=NONE/PAGE COUNTER/JOB NAME
	LCD DENSITY	=1/2
	AUTO ONLINE	=ON/OFF
	BUTTON REPEAT	Set the time for the display message to change when holding the + or - button at intervals of: 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 1.5 or 2.0 seconds. The factory setting is 0.1.
	MESSAGE SCROLL	Set the time in seconds that an LCD message will scroll across the display. From Level 1=0.2 to Level 10=2.0. The factory setting is Level 1.
ERROR BUZZER	OFF	
	NORMAL	There will be three sets of five Buzzes when an error occurs.
	SPECIAL	Buzzes five times consecutively until the error is cleared.
PANEL BUZZER	OFF	Disables buzz function when you press the button.
	ON	Enables buzz function when you press the button.
BUZZER VOLUME	LOW	Makes the buzz lower.
	HIGH	Makes the buzz higher.
POWER SAVE TIME	=1MIN:240MIN	
TONER LOW	=CONTINUE/STOP CONT: Continue printing even if there is a TONER LOW error. STOP: Stop printing if there is a TONER LOW error.	
AUTO CONTINUE	=OFF/ON	
LOCK PANEL	=OFF/ON Turn the lock panel setting ON or OFF.	
	PASS NO.=###	
REPRINT	=ON/OFF	
PAGE PROTECTION	PROTECT = AUTO	AUTO, OFF, LETTER, A4 OR LEGAL
EMULATION	=AUTO (EPSON)/AUTO(IBM)/HP LASER JET/....	

SETUP (continued)

Display Shows	Description	
KEEP PCL	=OFF/ON	
JAM RECOVERY	=OFF/ON	
RAMDISK SIZE	=0/1/2/...MB	RESTART PRINTER?
DELETE STORAGE	Delete the data in CompactFlash card or HDD.	
	Subsetting	**Description**
	SECURE FILE	Select the user name, job name and password.
	PUBLIC FILE	Select the user name and job name.
	PROOF FILE	Select the user name and job name.
	DATA ID (HD)	=####
	DATA ID (CF)	=####
	MACRO ID (HD)	=####
	MACRO ID (CF)	=####
	FONT ID (HD)	=####
	FONT ID (CF)	=####
	FORMAT (HD)	OK?
	FORMAT (CF)	OK?
TIME STYLE	=YY /MM /DD or MM /DD /YY or DD /MM /YY	
DATE & TIME	DISPLAY	YYYY/MM/DD HH/MM
	YEAR	=####
	MONTH	=##
	DAY	=##
	HOUR	=##
	MINUTE	=##

PRINT MENU

Display Shows	Description	
MEDIA TYPE	=PLAIN PAPER/TRANSPARENCIES/THICK PAPER/ THICKER PAPER/BOND PAPER/ENVELOPES/THIN PAPER	
PAPER	Set the paper size to LETTER, LEGAL, A4, EXECUTIVE, COM-10, DL, JIS B5, B5, A5, B6, A6, MONARCH, C5 and A4 LONG.	
COPIES	You can check the total number of printed pages.	
	Shows the number of printed pages (1 to 999).	
ORIENTATION	This printer can print pages in portrait or landscape orientation.	
	PORTRAIT or LANDSCAPE	
PRINT POSITION	This printer can be adjusted to align the page format.	
	Subsetting	**Description**
	X OFFSET=0	=-500:+500 Move the print start position (at the top-left corner of pages) horizontally up to -500 (left) to +500 (right) dots in 300 dpi.
	Y OFFSET=0	=-500:+500 Move the print start position (at the top-left corner of pages) vertically up to -500 (up) to +500 (down) dots in 300 dpi.
AUTO FF TIME	=OFF/1:99 (sec) Allows you to print the remaining data without pressing the **Go** button.	
FF SUPPRESS	=OFF/ON Turns the feed suppress (PAUSE) setting ON or OFF.	
HP LASERJET	**Subsetting**	**Description**
	FONT NO.	=I000:####
	FONT PITCH	=##.##
	SYMBOL SET	PC-8/... Set the symbol set or the character set.
	TABLE PRINT	Print code table.
	AUTO LF	=OFF/ON ON: CR→CR+LF, OFF: CR→CR

PRINT MENU (continued)

Display Shows	Description	
HP LASERJET (continued)	**Subsetting**	**Description**
	AUTO CR	=OFF/ON ON: LF LF+CR, FF+CR, or VT→VT+CR OFF: LF→LF, FF→FF, or VT→VT
	AUTO WRAP	=OFF/ON Select whether a line feed and carriage return will happen when the printer reaches the right margin.
	AUTO SKIP	=ON/OFF Select whether a line feed and carriage return will happen when the printer position reaches the bottom margin.
	LEFT MARGIN	=## Set the left margin at column 0 to 70 columns at 10 cpi.
	RIGHT MARGIN	=## Set the right margin at column 10 to 80 columns at 10 cpi.
	TOP MARGIN	=#.## Set the top margin at a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.5.
	BOTTOM MARGIN	=#.## Set the bottom margin at a distance from the bottom edge of the paper - 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.33(None-HP), 0.5(HP).
	LINES	=### Set the number of lines on each page from 5 to 128 lines.
EPSON FX-850	FONT NO.	=I000:####
	FONT PITCH	=##.##
	CHARACTER SET	PC-8/... Set the symbol set or the character set.
	TABLE PRINT	Print code table.

PRINT MENU (continued)

Display Shows	Description	
EPSON FX-850 (continued)	**Subsetting**	**Description**
	AUTO LF	=OFF/ON ON: CR→CR+LF OFF: CR→CR
	AUTO MASK	=OFF/ON
	LEFT MARGIN	Set the left margin at column 0 to 70 columns at 10 cpi.
	RIGHT MARGIN	Set the right margin at column 10 to 80 columns at 10 cpi.
	TOP MARGIN	Set the top margin at a distance from the top edge of the paper - 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.33.
	BOTTOM MARGIN	Set the bottom margin at a distance from the bottom edge of the paper - 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.33.
	LINES	Set the number of lines on each page from 5 to 128 lines.
IBM PROPRINTER	FONT NO.	=I000:####
	FONT PITCH	=##.##
	CHARACTER SET	PC-8/... Set the symbol set or the character set.
	TABLE PRINT	Print code table.
	AUTO LF	=OFF/ON ON: CR→CR+LF, OFF: CR→CR
	AUTO CR	=OFF/ON
	AUTO MASK	=OFF/ON
	LEFT MARGIN	Set the left margin at column 0 to 70 columns at 10 cpi.
	RIGHT MARGIN	Set the right margin at column 10 to 80 columns at 10 cpi.

PRINT MENU (continued)

Display Shows	Description	
IBM PROPRINTER (continued)	**Subsetting**	**Description**
	TOP MARGIN	Set the top margin at a distance from the top edge of the paper - 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.33.
	BOTTOM MARGIN	Set the bottom margin at a distance from the bottom edge of the paper - 0, 0.33, 0.5, 1.0, 1.5 or 2.0. The factory setting is 0.33.
	LINES	Set the number of lines on each page from 5 to 128 lines.
HP-GL	CHAR SET(STD)	=####
	CHAR SET(ALT)	=####
	PEN # SIZE	PEN1 to 6 (Set size and gray percentage for the selected pen.)
	PEN # GRAY	PEN1 to 6 15, 30, 45, 75, 90 or 100 % (# is the selected pen number)
BR-SCRIPT3	ERROR PRINT	=OFF/ON

NETWORK (only on a Network)

Display Shows	Description	
TCP/IP	**Subsetting**	**Description**
	TCP/IP ENABLE	=ON/OFF
	IP ADDRESS=	###.###.###.###
	SUBNET MASK=	###.###.###.###
	GATEWAY=	###.###.###.###
	IP BOOT TRIES	=#
	IP METHOD	=AUTO/STATIC/RARP/BOOTP/DHCP
NETWARE	NETWARE ENABLE	=ON/OFF
	NET FRAME	=AUTO/8023/ENET/8022/SNAP
APPLETALK	=ON/OFF	
NETBEUI	=ON/OFF	
DLC/LLC	=ON/OFF	
BANYAN	=ON/OFF	
LAT	=ON/OFF	
NETBIOS/IP	=ON/OFF	
APIPA	=ON/OFF	
ENET	=AUTO/100B-FD/100B-HD/10B-FD/10B-HD	

INTERFACE

Display Shows	Description		
SELECT	=AUTO/PARALLEL/RS-232C/USB/NETWORK		
AUTO IF TIME	= 1:99 (sec) You need to set the time-out period for the auto interface selection.		
INPUT BUFFER	= Level1:15 Increase or decrease the input buffer capacity.	RESTART PRINTER?	
PARALLEL	When using the parallel interface		
	Sub-setting Menu	**Description**	
	HIGH SPEED	=ON/OFF Turns high-speed parallel communications on or off.	
	BI-DIR	=ON/OFF Turns bi-directional parallel communications on or off.	
RS-232C	When using the serial interface		
	Sub-setting Menu	**Description**	
	FAX MODE	=OFF/ON	RESTART PRINTER?
	BAUDRATE [*1]	Data transfer speed can be set to 150/300/600/1200/2400/4800/9600/19200/38400/57600/115200 baud.	
	CODETYPE [*1]	=8 BITS/7 BITS The data length can be set to 7 or 8 bits.	
	PARITY [*1]	=NONE/ODD/EVEN The data error check can be set to NONE, ODD or EVEN.	
	STOP BIT [*1]	=1 BITS/2 BITS The data separator can be set to 1 or 2 stop bits.	
	XON/XOFF [*1]	=ON/OFF Handshake protocol can be set to on or off.	

INTERFACE (continued)

Display Shows	Description	
RS-232C (continued)	**Sub-setting Menu**	**Description**
	DTR(ER)[*1]	=ON/OFF
	ROBUST XON [*1]	=OFF/ON
	RING DELAY [*2]	=0/1/2/3/4
	REDUCTION [*2]	=AUTO/OFF/90%
	RAM SIZE [*2]	=1:##MBYTE
	RECEIVE [*2]	=ON/OFF
	INTERVAL [*2]	=OFF/6H/12H/24H/2D/4D/7D

[*1] Appears when FAX MODE is off.

[*2] Appears when FAX MODE is on.

RESET MENU

Display Shows	Description
RESET PRINTER	Resets the printer and restores all printer settings (including command settings) to settings you have previously made with the control panel buttons.
FACTORY RESET	Resets the printer and restores all printer settings (including command settings) to the factory settings. See *List of factory settings* in this chapter.

Set date and time

```
--MENU--
INFORMATION
```

↓ Press the **+** or **-** button until the SETUP mode appears (and to display each setting shown below).

```
--MENU--
SETUP
```

↓ Press the **Set** button, and then press the **+** or **-** button until DATE & TIME appears.

```
SETUP
DATE & TIME
```

↓ Press the **Set** button, and then press the **+** or **-** button until YEAR appears.

```
DATE & TIME
YEAR
```

↓ Press the **Set** button.

```
YEAR
=1999                *
```

↓ Press the **+** button.

```
YEAR
=2000
```

↓ Press the **Set** button.

```
YEAR
=2000                *
```

↓ Press the **Set** button.

```
DATE & TIME
YEAR
```

↓ Press the **Set** button.

```
DATE & TIME
MONTH
```

↓

```
DATE & TIME
2000/04/25 10:22
```

Set IP Address

```
--MENU--
INFORMATION
```

Press the **+** or **-** button until the NETWORK mode appears (and to display each setting shown below).

```
--MENU--
NETWORK
```

Press the **Set** button.

```
NETWORK
TCP/IP
```

Press the **Set** button.

```
TCP/IP
TCP/IP ENABLE
```

Press the **+** button.

```
TCP/IP
IP ADDRESS=
```

Press the **Set** button.

```
IP ADDRESS=
192.0.0.192     *
```

The last digit in the first part of the number is blinking.
Press the **+** or **-** button to increase or decrease the number.
Press the Set button to go to the next number.

```
IP ADDRESS=
123.0.0.192
```

Repeat this process until you have set your IP address.

```
IP ADDRESS=
123.45.67.89
```

Press the **Set** button to complete the IP address.

```
IP ADDRESS=
123.45.67.89    *
```

An asterisk appears at the end of the display.

About emulation modes

This printer has the following emulation modes.

HP LaserJet Mode

The HP LaserJet mode (or HP mode) is the emulation mode in which this printer supports the PCL6 language of the Hewlett-Packard LaserJet laser printer. Many software applications support this type of laser printer. Using this mode will allow your printer to operate at its best with those applications.

BR-Script 3 Mode

BR-Script is an original Brother page description language and a PostScript® language emulation interpreter. This printer supports level 3. The BR-Script interpreter of this printer allows you to control text and graphics on pages.

For technical information about PostScript commands, see the following manuals:

- Adobe Systems Incorporated. *PostScript Language Reference Manual, 3rd Edition*. Menlo Park: Addison-Wesley Publishing Company, Inc., 1999.
- Adobe Systems Incorporated. *PostScript Language Program Design*.
  Menlo Park: Addison-Wesley Publishing Company, Inc., 1988.
- Adobe Systems Incorporated. *PostScript Language Reference Manual*. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. *PostScript Language Tutorial and Cookbook*. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. *PostScript Language Reference Manual, third Edition*. Addison-Wesley Longman, Inc., 1999.

HP-GL Mode

The HP-GL mode is the emulation mode in which this printer supports the HP-GL language of the Hewlett-Packard plotter model HP-7475A. Many graphics and CAD applications support this type of plotter. Use this mode so your printer will work when printing from those types of applications.

EPSON FX-850 and IBM Proprinter XL Mode

The EPSON FX-850 and IBM Proprinter XL modes are the emulation modes that this printer supports to meet the industry-standard for dot matrix printers. Some applications support these dot matrix printer emulations. Use these emulation modes so your printer will work well when printing from those types of applications.

List of factory settings

The following table shows the factory settings.

- The emulation mode affects the setting. Effective modes are shown in brackets in the following table.
- The following settings cannot be restored to the factory settings with the reset menu in the factory settings mode - interface mode, HRC setting, page protection, scalable font, lock panel, page counter and local language for display messages.
- The copy setting is always restored to the factory setting when the printer is turned off and on again.
- It is not possible to reset the network settings using the control panel. If you want to reset the print server to its factory settings (resetting all information such as the password and IP address information), hold down the Network Test button on the Network board (NC-4100h) for more than 5 seconds.

Display Shows	Submenu	Factory setting
PAPER	SOURCE	=AUTO
	PRIORITY	=MP>T1>T2>T3>T4
	MP FIRST	=OFF
	MP SIZE	=ANY/A4/LETTER
	MANUAL FEED	=OFF
	DUPLEX	=OFF
	OUTPUT	=STANDARD
QUALITY	RESOLUTION	=600
	HRC	=MEDIUM
	TONER SAVE	=OFF
	DENSITY	0
SETUP	LANGUAGE	=ENGLISH
	PANEL CONTROL	LOWER LCD=NONE LCD DENSITY=1 AUTO ONLINE=ON BUTTON REPEAT=0.1 SEC MESSAGE SCROLL=LEVEL 1
	POWER SAVE TIME	=30MIN

Display Shows	Submenu	Factory setting
SETUP (continued)	TONER LOW	CONTINUE
	AUTO CONTINUE	=OFF
	LOCK PANEL	=OFF
	REPRINT	=ON
	PAGE PROTECTION	=AUTO
	EMULATION	=AUTO(EPSON)
	KEEP PCL	=OFF
	JAM RECOVERY	=ON
	RAMDISK SIZE	=0MB
	TIME STYLE	=YY/MM/DD hh:mm
PRINT MENU	MEDIA TYPE	=PLAIN PAPER
	PAPER	=A4/LETTER
	COPIES	=1
	ORIENTATION	=PORTRAIT
	PRINT POSITION	X OFFSET=0 Y OFFSET=0
	AUTO FF TIME	=5
	FF SUPPRESS	=OFF
	HP LASERJET	FONT NO.=59
		FONT PITCH=10.00/12.00
		SYMBOLSET=PC8
		AUTO LF=OFF
		AUTO CR=OFF
		AUTO WRAP=OFF
		AUTO SKIP=ON
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####

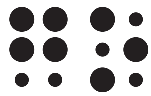
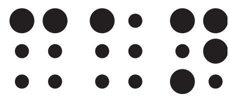
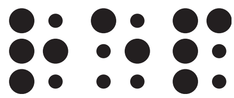
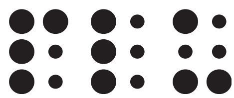
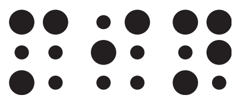
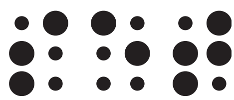
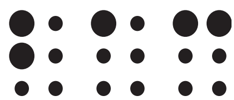
Display Shows	Submenu	Factory setting
PRINT MENU (continued)	EPSON FX-850	FONT NO.=59
		FONT PITCH=10.00/12.00
		SYMBOLSET=US ASCIF
		AUTO LF=OFF
		AUTO MASK=OFF
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####
	IBM PROPRINTER	FONT NO.=59
		FONT PITCH=10.00/12.00
		SYMBOLSET=PC8
		AUTO LF=OFF
		AUTO CR=OFF
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####
	HP-GL	CHAR SET(STD)=####
		CHAR SET(ALT)=####
		PEN # SIZE
		PEN # GRAY
	BR-SCRIPT	ERROR PRINT=OFF
NETWORK	TCP/IP	TCP/IP ENABLE=ON
		IP ADDRESS=192.0.0.192
		SUBNET MASK=0.0.0.0
		GATEWAY=0.0.0.0

Display Shows	Submenu	Factory setting
NETWORK (continued)	TCP/IP (continued)	IP BOOT TRIES=3
		IP METHOD=AUTO
	NETWARE	NETWARE ENABLE=ON
		NET FRAME=AUTO
	APPLETALK	=ON
	NETBEUI	=ON
	DLC/LLC	=ON
	BANYAN	=ON
	LAT	=ON
	NETBIOS/IP	=ON
	APIPA	=OFF
	ENET	=AUTO
INTERFACE	SELECT	=AUTO
	AUTO IF TIME	=5
	INPUT BUFFER	=LEVEL 3
	PARALLEL	HIGH SPEED=ON
		BI-DIR=ON
	RS-232C	FAX MODE=OFF
		BAUD RATE=9600
		CODE TYPE=8 BITS
		PARITY=NONE
		STOP BIT=1 BITS
		X ON/X OFF=ON
		DTR(ER)=ON
		ROBUST XON=OFF
		RING DELAY=0
		REDUCTION=AUTO
		RAM SIZE=1MB
		RECEIVE=ON
		INTERVAL=OFF

For visually-impaired users

Braille symbols

The control panel buttons are marked with Braille characters for visually-impaired users as shown in the table.

Button	Abbreviations	Braille*
Go	Go	
Job Cancel	Can	
Reprint	Rep	
+	Plu	
-	Min	
Set	Set	
Back	Bac	

*Braille indicates the first 2 or 3 letters of the English button name. For example, **Job Cancel** is shown as “can” and **+** (Plus) is shown as “plu” in Braille.

Buzz indications

The control panel has a buzzer. The buzzer will sound when one of the control panel buttons is pressed, or the status of the printer changes. See the table for a description of the buzzer meaings.

Buzz indications	Conditions
A short buzz	■ When you enter any information using the button.
Two short buzzes	■ When you come back to the top menu option after you move forward or backward through the menus. ■ When you move to another menu level.
Five short buzzes	■ When an error occur.
A long buzz	■ When you set any optional menu setting.
Two long buzzes	■ When the printer becomes online. ■ When the printer becomes READY status after a warming up condition.
A short and a long buzz	■ When you enter wrong information.

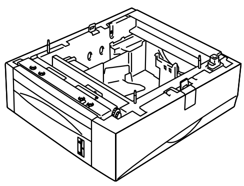
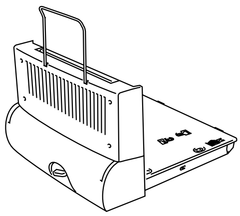
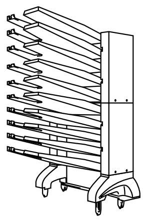
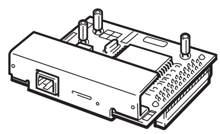
You can change the settings of the buzzer by using the buttons on the control panel.
To chagne the setting of the buzzer, press the **+** (plus) button until SETUP is displayed, then press the **Set** button. Press the **+** (plus) button until ERROR BUZZER, PANEL BUZZER or BUZZER VOLUME is displayed and press **Set**.
See *SETUP* in this chapter for a description of the buzzer settings.

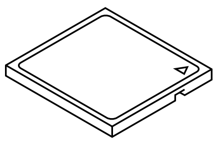
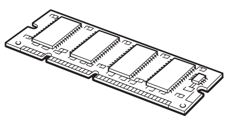
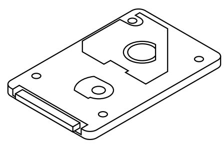
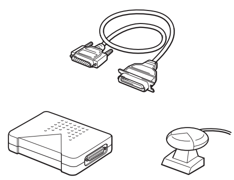
4 Options

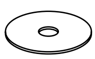
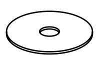
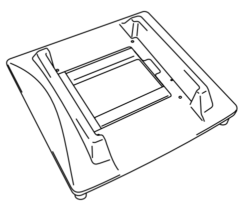
Optional accessories and supplies

This printer has the following optional accessories. You can increase the capabilities of the printer with these items.

Options

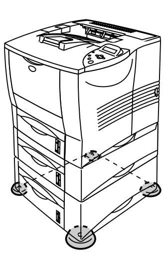
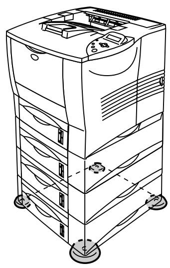
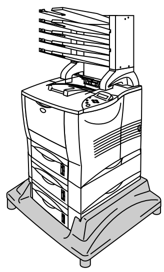
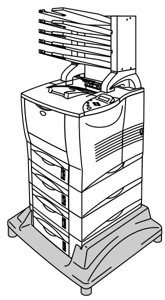
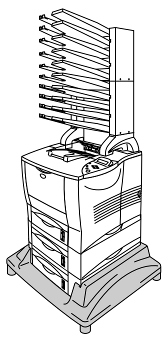
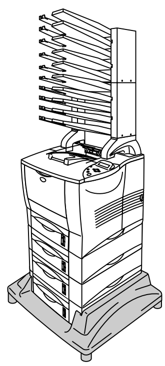
Lower tray unit (Three paper trays)	Duplex unit	Mailbox unit	Network board (For HL-7050 only)
LT-7000	DX-7000	MX-7000 series	NC-4100h
			
see 4-3	see 4-4	see 4-6	see 4-8

CompactFlash card	DIMM memory	HDD	Ir-DA interface
		HD-EX	IR-1000
			
see 4-11	see 4-13	see 4-17	see 4-21

Optional font package	Optional Barcode Font	Optional stabilizer
BS-3000	BT-1000	SB-4000
		
see 4-22	see 4-22	see 4-2

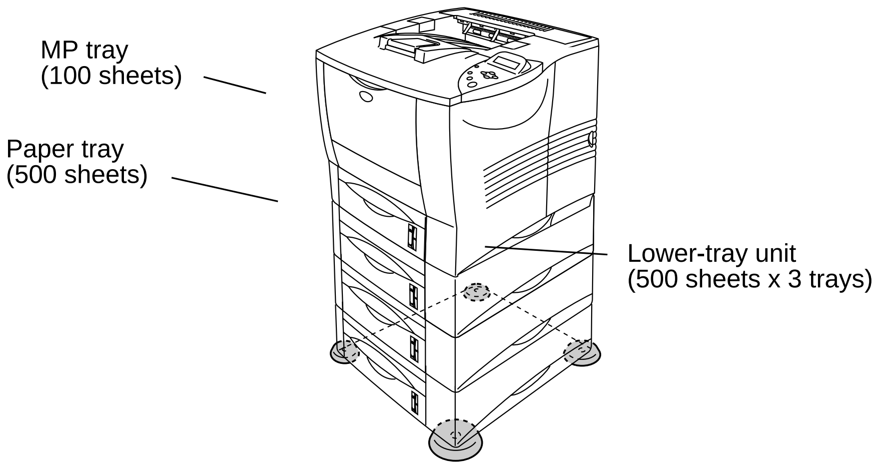
Small pad for lower tray unit and stabilizer (SB-4000)

When you have the following printer options, you must install the small pads or the optional stabilizer.

	1 Lower tray	2 Lower trays	3 Lower trays
Non-mailbox unit	--------------------		
Mailbox unit (5 bins)	--------------------		
Mailbox unit (10 bins)	--------------------		

Lower-tray unit (LT-7000)

The lower-tray unit (Trays 2/3/4) is an optional device that can hold extra paper. It can hold up to 500 sheets of paper (80 g/m^2 or 20 lb) in each tray. When all three trays are installed, the printer can hold up to 2100 sheets of plain paper. If you want to buy an optional lower-tray unit, call the dealer you bought the printer from.



Expands up to a total of 2100 sheets

Figure 4-1

To install the lower-tray unit, please see the User's Guide that we have supplied with the lower tray.

- If you put the lower-tray unit on the floor, we strongly recommend that you put the small pads that we have supplied on the underside of the lower-tray unit as shown above.
- Even if a tray has been moved to another tray position, the driver will find the correct tray and print according to the setting.

Duplex unit (DX-7000)

The Duplex unit is an optional device that allows you to print on both sides of a piece of paper. When it is installed, you can select either duplex printing or simplex printing on the control panel or with a software command. For more information about the control panel, see PAPER menu in *Chapter 3*.

To install the duplex unit, please see the User's Guide that we have supplied with the Duplex unit.

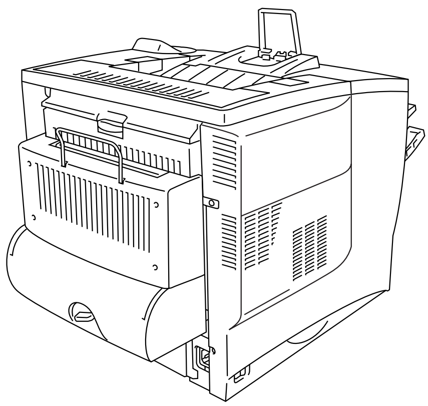


Figure 4-2

Guidelines for printing on both sides of the paper

- If the paper is thin, it may wrinkle.
- If paper is curled, straighten it, and then place it in the paper tray.
- If the paper is not feeding correctly, it may be curled. Remove the paper and straighten it.

Paper orientation for printing on both sides of the paper

The printer prints the second page first.
If you print 10 pages onto 5 piece of paper, it will print page 2 then page 1 on the first piece of paper.
It will print page 4 then page 3 on the second piece of paper.
It will print page 6 then page 5 on the third piece of paper, and so on.

When doing duplex printing, the paper must be put into the paper tray in the following way:

- For the multi-purpose (MP) tray.
  Put the side to be printed on first, face-up, with top of the paper furthest away from the printer.
  If letterhead paper is used, this would be put in to the MP tray with the heading facedown, and the furthest away from the printer.

- For the paper tray and optional lower tray (tray1, 2, 3 or 4):
  Put the side to be printed on first, facedown, with the top of the paper at the back of the tray.
  If letterhead paper is used, this would be put in to the paper tray or optional lower tray with the heading face-up, and at the back of the tray.

Mailbox unit

The Mailbox unit is an optional device that can be installed on the HL-7050 laser printer to allow you to direct your printouts to any bin that you want.

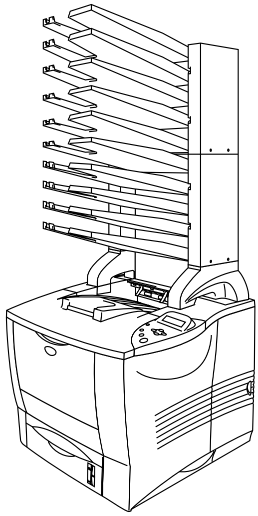


Figure 4-3

To install the Mailbox unit, please see the User's Guide that we have supplied with the Mailbox.

Mailbox

This setting allows you to direct your printouts to any bin that you specify.

Sorter

When you want to print a lot of copies of a document, you can print each copy and direct it to the bin that you want. You will not have to sort the copies after printing them.

Stacker

You can print large print jobs when no one is in the office. You can print 100 sheets of plain paper to each bin of the mailbox. When you remove bins 2, 4, 7 and 9, the total output increases to 1900 sheets (including the printer output tray).

Network option NC-4100h (For HL-7050 only)

Installing the Brother network board (NC-4100h) allows you to use the printer in the TCP/IP, IPX/SPX, AppleTalk, DLC/LLC, Banyan VINES, DEC LAT and NetBEUI. Many useful features, such as BRAdmin Professional for the administrator and Brother network printing software, are included on the CD-ROM supplied with the HL-7050 printer.

For setup, see the Network User's Guide.

Installing the Network board

1 Turn off the printer power switch, and then unplug the printer.

2 Open the side cover.

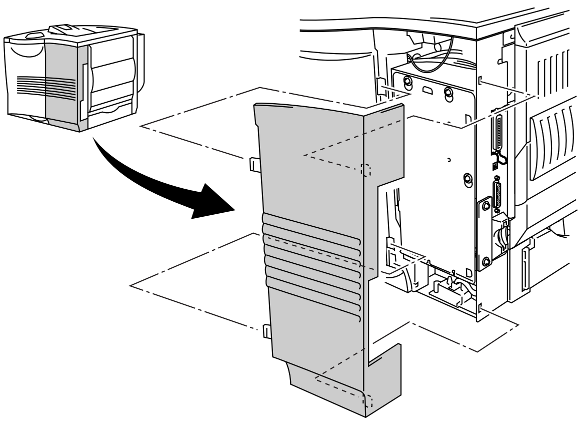


Figure 4-4

3 Loosen the three screws, and then remove the metal plate by lifting up slightly.

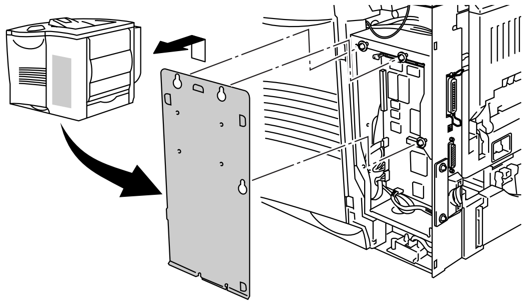


Figure 4-5

4 Unscrew the two screws, and then remove the Network cover plate.

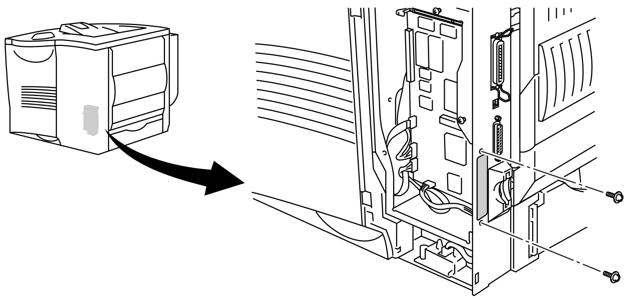


Figure 4-6

5 Put the network board connector firmly into the connector of the main controller board, and then secure it with the two screws.

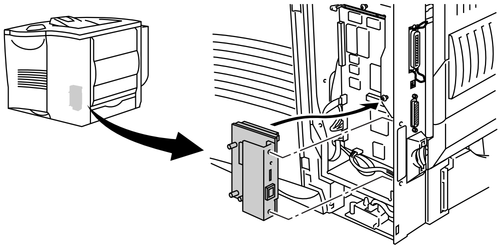


Figure 4-7

6 Secure the metal plate with the three screws.

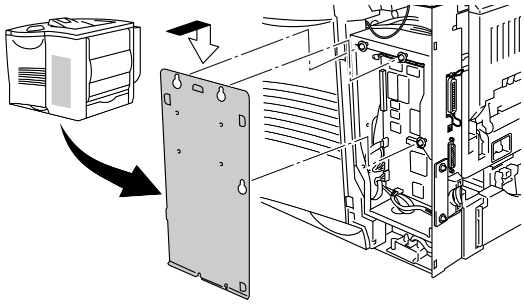


Figure 4-8

7 Close the side cover.

8 Connect one end of the Ethernet Cable to the Network port of the printer.

9 Plug the printer back in, and then turn on the power switch.

10 For details about how to use the Network board, please see the Network User's Guide on the CD-ROM that we have supplied with this printer.

CompactFlash card

This printer has a slot for an optional CompactFlash card, which is a memory card.

If you install an optional CompactFlash memory card, you can save macros, the print log and fonts on it. This card lets you select the Reprint functions through the network.

You can install the following types of CompactFlash memory cards.

<SanDisk (or SanDisk OEM Products)>

Type I

- 16 MB SDCFB-16-801
- 32 MB SDCFB-32-801
- 64 MB SDCFB-64-801
- 96 MB SDCFB-96-801
- 128 MB SDCFB-128-801
- 192 MB SDCFB-192-801
- 256 MB SDCFB-256-801
- 384 MB SDCFB-384-801
- 512 MB SDCFB-512-801

- Make sure the printer power is OFF before you install or remove a card so you don't seriously damage it or lose all its data.
- For more information about the cards, call the dealer you bought the printer from.

Installing the CompactFlash card

Follow these steps to install or remove a card:

1 Turn off the printer power switch, and then unplug the printer.

2 Insert a CompactFlash card into the slot with the label facing to the left.
Make sure you put it in properly.

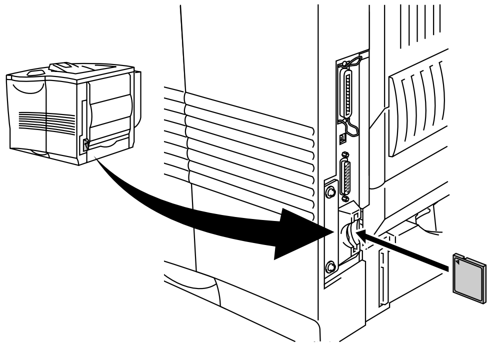


Figure 4-9



Before you remove the card, turn the power switch OFF, and then unplug the printer. To remove the card, pull it out of the printer.

RAM expansion

The HL-7050 and HL-7050N printer have 32 MB of standard memory and two slots for optional memory expansion. You can expand the memory up to 288 MB by installing dual in-line memory modules (DIMMs). (The standard memory varies depending on the printer model and country.)

You can install the following DIMMs:

<US>

16 MB	Techworks	12456-0001
32 MB	Techworks	12457-0001
64 MB	Techworks	12458-0001
128 MB	Techworks	12459-0001

For more information, visit Techworks website at www.techworks.com

<Europe>

16 MB	Buffalo Technology	12323-0001
32 MB	Buffalo Technology	12324-0001
64 MB	Buffalo Technology	12325-0001
128 MB	Buffalo Technology	12326-0001

In general, the DIMM must have the following specifications:

Type:	100 pin and 32 bit output
CAS lantency:	2 or 3
Clock frequency:	66 MHz or more
Capacity:	16, 32, 64 or 128 MB
Height:	46 mm (1.8 in.) or less
Parity:	NONE
Dram Type:	SDRAM 4 Bank

SDRAM can be used.

- For more information, call the dealer you bought the printer from.
- For the latest information and drivers, visit the Brother Solutions Center at http://solutions.brother.com

Installing extra DIMM memory

When you install extra memory, follow these steps:

1 Turn off the printer power switch, and then unplug the printer. Disconnect the interface cable from the printer.

Make sure you turn the power to the printer OFF before you install or remove the DIMM.

2 Remove the side cover.

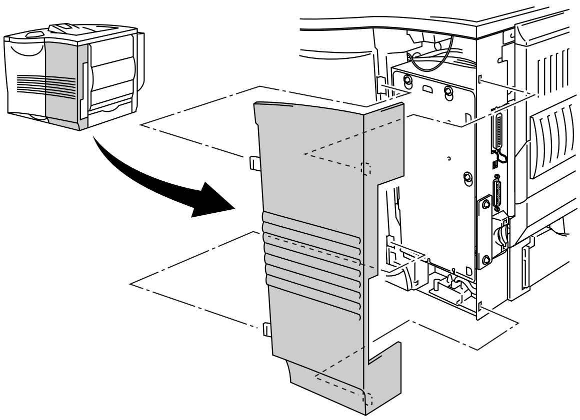


Figure 4-10

3 Loosen the three screws, and then remove the metal plate by lifting it up slightly.

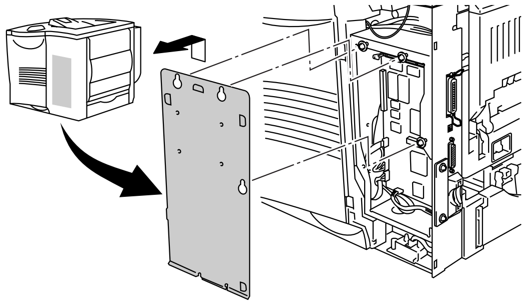


Figure 4-11

4 Unpack the DIMM and hold it by its edges.

5 Hold the DIMM with your fingers on the side edges and your thumb on the back edge. Line up the notches on the DIMM with the DIMM slot. (Check that the locks on each side of the DIMM slot are open or facing outwards.)

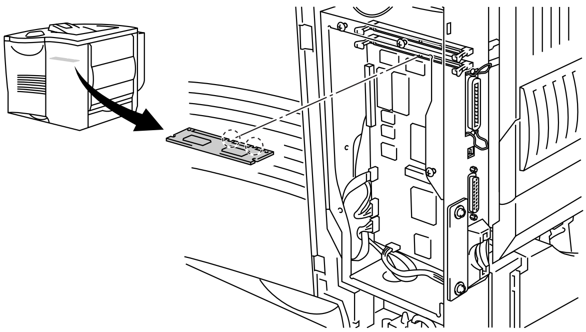


Figure 4-12

6 Press the DIMM straight into the slot (press firmly). Make sure the locks on each side of the DIMM click into place. (To remove a DIMM, you must release the locks.)

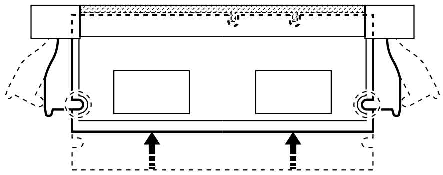


Figure 4-13

7 Secure the metal plate with the three screws.

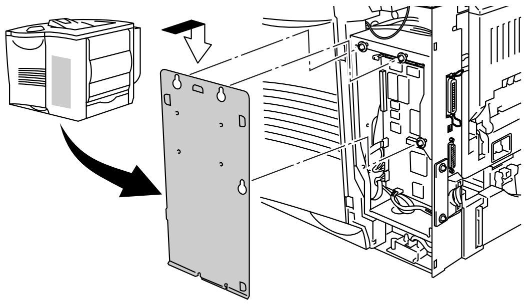


Figure 4-14

8 Put the side cover back on.

9 Reconnect the interface cable to your printer.
Plug the printer back in, and then turn on the printer power switch.

10 To check whether the DIMM has been installed properly, you can print the Print Settings listing that shows the current memory size. To print the Print Settings listing, see *Chapter 3*.

Hard disk drive (HD-EX)

If you install an optional HDD, you can save macros, the print log, fonts and print jobs on it. After you store a print job, you can reprint it from the control panel or through the network using a Web-browser. See the sections on printing PROOF, PUBLIC and SECURE data in *Chapter 3*.

Make sure that the box contains the following items:

- Hard disk
- Two hard disk cables
- Four shoulder screws
- Four screws (4)
- Quick Setup Guide

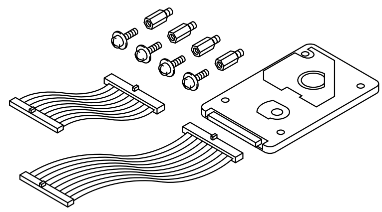


Figure 4-15



Use the longer cable for this printer model. The shorter cable is for other printers.

1 Turn off the printer power switch, and then unplug the printer. Disconnect the interface cable from the printer.

2 Remove the side cover.

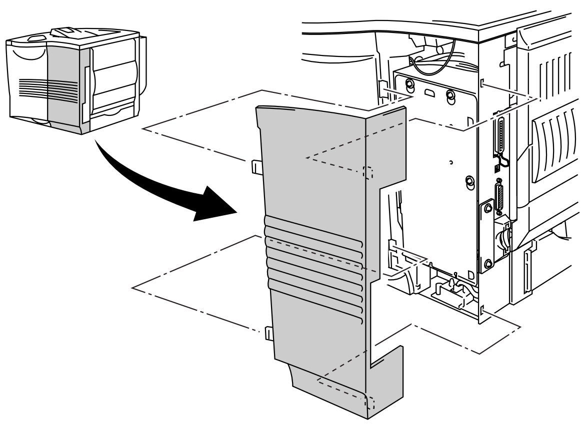


Figure 4-16

3 Loosen the three screws, and then remove the metal plate by lifting it up slightly.

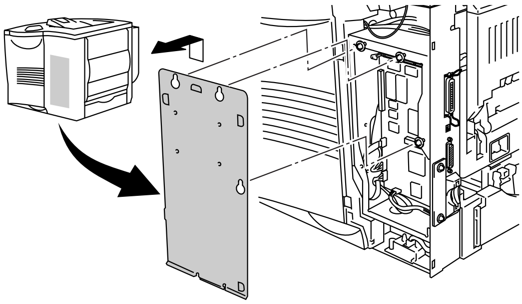


Figure 4-17

4 Put the four shoulder screws, supplied with the HDD unit, into the bottom of the HDD.

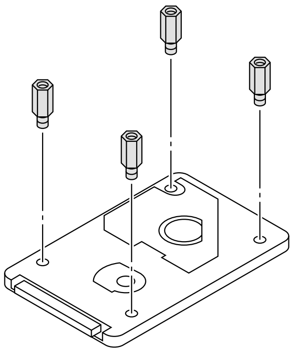


Figure 4-18

5 Connect the longer hard disk cable to the HDD with the keyed side facing up.

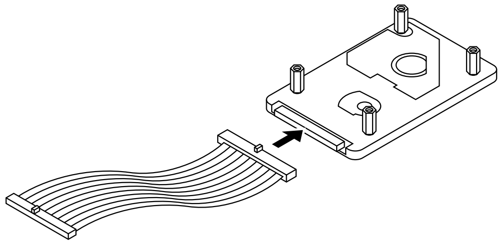


Figure 4-19

6 Install the HDD base plate by putting the four screws into the four holes of the metal plate so that the HDD pins point to the back of the printer. Then secure the plate with the four screws.

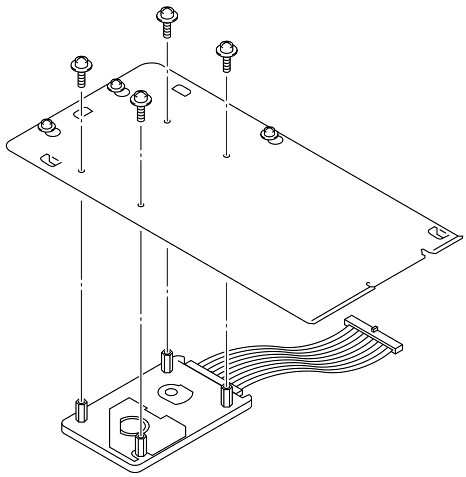


Figure 4-20

7 Connect the flat cable to the main controller board.

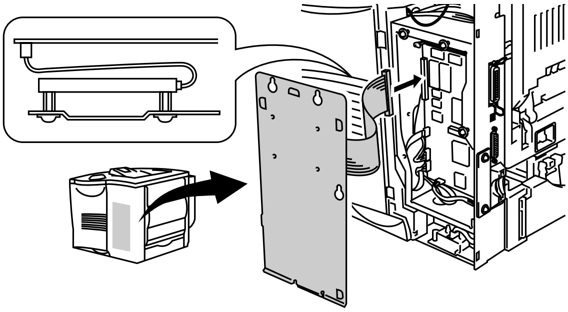


Figure 4-21

8 Secure the metal plate with the three screws.

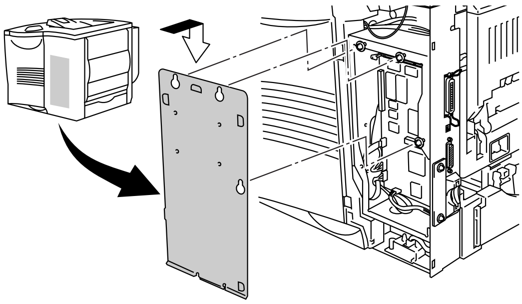


Figure 4-22

9 Put the side cover back on.

10 Reconnect the interface cable to your printer.
Plug the printer back in, and then turn on the printer power switch.

11 Format the HDD from the control panel. See *Chapter 3* for details.

Ir-DA interface (IR-1000)

IR-1000 connects to any printer and prints data without using connecting cables.

- Supports IrDA1.1 infrared communication standard.
- Fully compatible with Windows® 95/98/Me, Windows NT® 4.0 and Windows® 2000 infrared printer device.
- Transmits and receives data at up to 4 MB a second.
- Connects to the parallel ports of the computer and printer.
- Allows a printer to communicate with an infrared-equipped portable computer.
- Transmission range: 1 cm (3.9 in.) up to 100 cm (39 in.), meets the IrDA standard.
- 30 degree cone angle.
- Switches between infrared or parallel port.

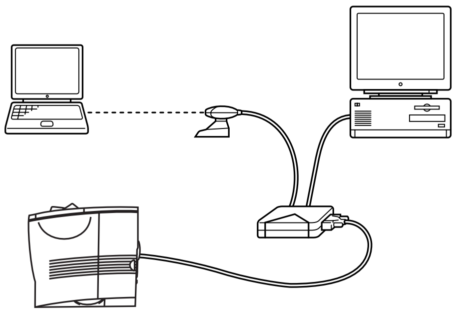


Figure 4-23

Optional font package (BS-3000)

The optional font package (BS-3000) is the CD-ROM you need for installing the 136 PS3 Agfa and TrueType Fonts.

Optional barcode fonts package (BT-1000)

The optional Barcode fonts package (BT-1000) is the CD-ROM you need for installing the Barcode fonts.

5 Routine maintenance

Replacing the consumables

You will need to replace the consumables regularly. When the time comes to replace consumables, the following messages will appear on the LCD panel.

(Appears at intervals)

```
TONER LOW
```

See the *TONER LOW* explanation in this chapter.

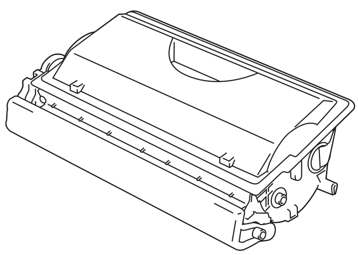
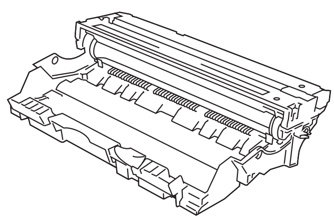
```
TONER LIFE END
```

See the *TONER LIFE END* explanation in this chapter.

```
CHANGE DRUM SOON
```

See the *CHANGE DRUM SOON* explanation in this chapter.

Accessories

Toner Cartridge	Drum Unit
	
See *Replacing the toner cartridge* in this chapter	See *Replacing the drum unit* in this chapter

Toner cartridge

A new toner cartridge contains enough toner to print up to 12,000 A4 or Letter-size single-sided pages at about 5% coverage.

- Toner consumption varies according to the image coverage on the page and the print density setting.
- The greater the image coverage, the greater the toner consumption.
- If you change the print density setting for lighter or darker printing, toner consumption varies accordingly.
- Wait to unpack the toner cartridge until immediately before you install it in the printer.

TONER LOW Message

(Appears at intervals)

```
TONER LOW
```

If the LCD shows TONER LOW, the toner cartridge has nearly run out of toner. Purchase a new toner cartridge and have it ready before you get a TONER EMPTY message. To replace the toner cartridge, see *Replacing the toner cartridge* in this chapter.

TONER LIFE END message

```
TONER LIFE END
```

Check printed pages, page counter, and LCD messages routinely.
When TONER LIFE END is displayed on the LCD, we have two conditions as to why this has happened.
First condition: Actual: this is when the ‘Actual’ amount of toner in the toner cartridge has been used up.
Second condition: Mechanical: this is when the ‘Mechanical’ components of the toner cartridge have physically reached the end of their life.
For both conditions the printer will stop printing, until a new toner cartridge has been put into the printer.
TONER LIFE END can only be cleared, by putting a new toner cartridge into the drum unit.

Replacing the toner cartridge

To make sure you get high quality print, make sure you use quality toner cartridges. When you want to buy toner cartridges, call the dealer you bought the printer from.

1 Open the top cover of the printer.

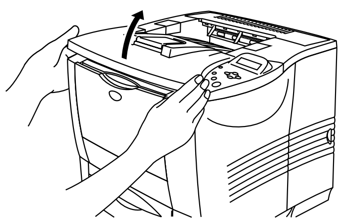


Figure 5-1

2 Push down the blue lock lever and take out the toner cartridge.

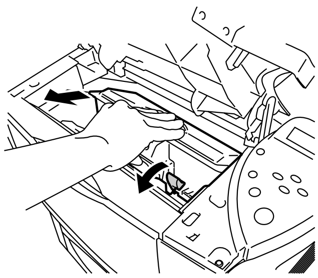


Figure 5-2

- Handle the toner cartridge carefully. If toner scatters on your hands or clothes, immediately wipe or wash it off with cold water.
- Do not touch the shaded parts shown in Figure 5-3 and Figure 5-4.

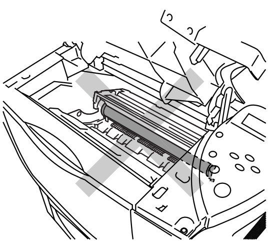


Figure 5-3

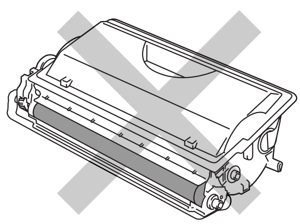


Figure 5-4

- Be sure to seal the toner cartridge tightly so toner powder does not spill out of the cartridge.
- Discard the used toner according to local regulations, keeping it separate from domestic waste. If you have questions, call your local waste disposal office.

3 Unpack the new toner cartridge. Hold the cartridge level with both hands and gently rock it from side to side several times to spread the toner evenly inside the cartridge.

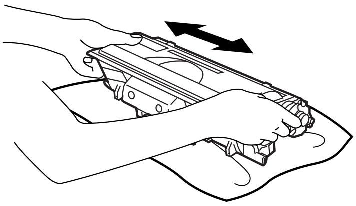


Figure 5-5

4 Pull off the yellow plastic protective cover.

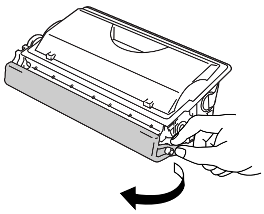


Figure 5-6

- Put the toner cartridge in the printer immediately after you remove the protective cover.
- Do not touch the shaded parts shown in Figure 5-7.

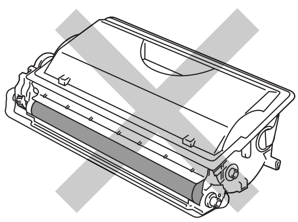


Figure 5-7

5 Put the new toner cartridge firmly into the printer.   If you put it in properly, the blue lock lever will lift automatically.

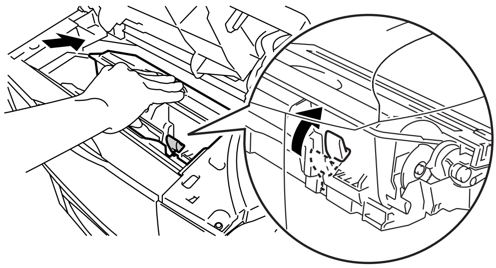


Figure 5-8

6 Close the top cover of the printer.

7 If the LCD shows CARTRIDGE ERROR, take out the toner cartridge and then put it back into the printer again.

Drum unit

CHANGE DRUM SOON message

```
CHANGE DRUM SOON
```

The printer uses a drum unit to create the print images on paper. If the LCD shows CHANGE DRUM SOON, it means the drum unit is near the end of its life. We recommend that you replace the drum unit with a new one before there is a noticeable deterioration in the print quality.

Replacing the drum unit

Every time you replace the drum unit, you should clean the inside of the printer. For more information, see *Cleaning* in this chapter.

This printer can print up to 40,000 pages [*1] with one drum unit.

- There are many factors that determine the actual drum life, such as temperature, humidity, type of paper, type of toner used, the number of pages per print job and so on. Under ideal conditions, the average drum life is estimated at up to 40,000 pages. The actual number of pages that your drum will print may be significantly less than this estimate. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.
- For best performance, use only genuine Brother toner. The printer should be used only in a clean, dust-free environment with adequate ventilation.

[*1] At 5 % coverage print (A4 or Letter size). The actual number of printed pages will vary depending on the average type of print job and paper.

1 Open the top cover of the printer.

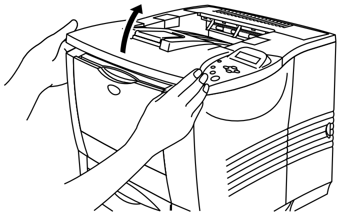


Figure 5-9

2 Pull out the drum unit assembly (drum unit with the toner cartridge).

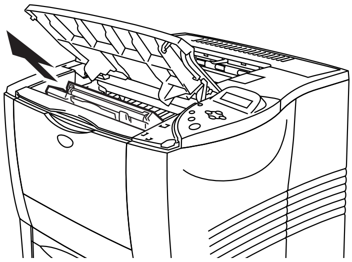


Figure 5-10

- We recommend that you place the drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner.
- To prevent damage to the printer from static electricity, do not touch the electrodes shown in Figure 5-11.

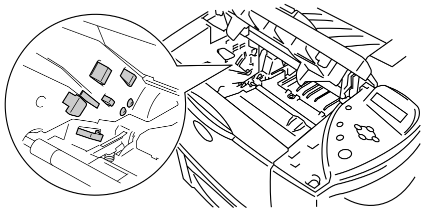


Figure 5-11

3 Push down the blue lock lever and take the toner cartridge out of the drum unit assembly.

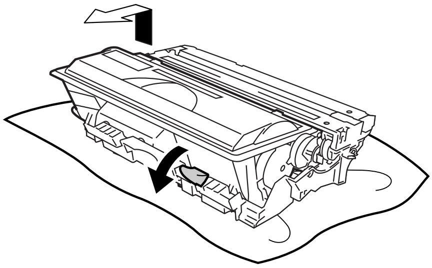


Figure 5-12

- Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.
- Do not touch the shaded parts shown in Figure 5-13.

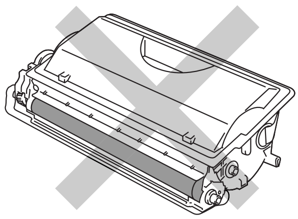


Figure 5-13

- Discard the used drum unit according to local regulations, keeping it separate from domestic waste. If you have questions, call your local waste disposal office.
- Be sure to seal up the drum unit tightly in a bag so that toner powder does not spill out of the unit.

4 Unpack the new drum unit.

- Wait to unpack a drum unit until immediately before you put it in the printer. Exposure to direct sunlight or room light may damage the drum unit.
- Do not touch the shaded parts shown in Figure 5-14.

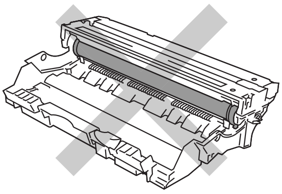


Figure 5-14

5 Put the toner cartridge in the new drum unit. If you put the cartridge in properly, the blue lock lever is lifted automatically.

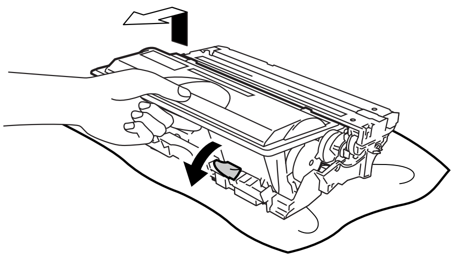


Figure 15

- Make sure you install the toner cartridge properly, or it may separate from the drum when you pick up the drum unit.

6 Put the drum unit assembly in the printer.

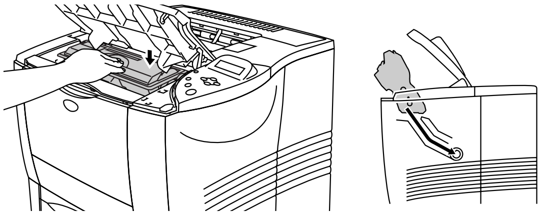


Figure 5-16

■ We recommend that you clean the inside of the printer when you replace the drum unit. See *Cleaning* in this chapter.

7 Reset the page counter following the instructions we have supplied with the new drum unit.

■ If you replace only the toner cartridge, do not reset the page counter.

8 Close the top cover of the printer.

Replacing Maintenance Parts

You will need to replace the maintenance parts regularly to maintain print quality. When it is time to replace these parts, the following messages will appear on the LCD.

```
REPLACE PF KIT
```

See *Maintenance Messages* in this chapter.

```
REPLACE FUSER
```

See *Maintenance Messages* in this chapter.

```
REPLACE LASER
```

See *Maintenance Messages* in this chapter.

Cleaning

Clean the outside and inside of the printer with a **dry soft** cloth. When you replace the drum unit, make sure you clean the inside of the printer. If printed pages are stained with toner, clean the inside of the printer with a dry soft cloth.

Cleaning the outside of the printer

Clean the outside of the printer as follows:

1. Turn off the printer power switch, and then unplug the printer power cord.
2. Pull the paper tray out of the printer.
3. Open the multi-purpose tray.

4 Wipe the outside of the printer with a soft cloth to remove dust.

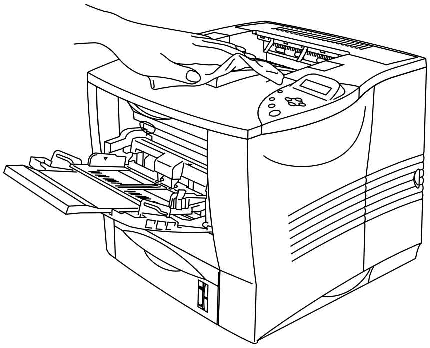


Figure 5-17

5 Remove anything that is stuck inside the paper tray.

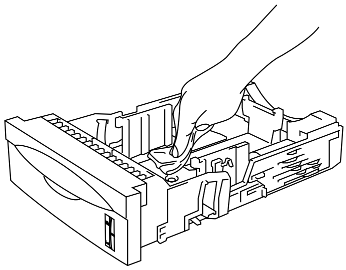


Figure 5-18

6 Put the paper tray back in the printer, and then close the multi-purpose tray.

7 Plug the printer power cord back in, and then turn the printer power switch back on.

Cleaning the inside of the printer



When you clean the inside of the printer, pay attention to the following:

- If your clothes are smeared with toner, wipe off the toner with a dry cloth and immediately wash the clothes in cold water to avoid stains.
- Never touch the hot fuser.
- Be careful not to inhale the toner.

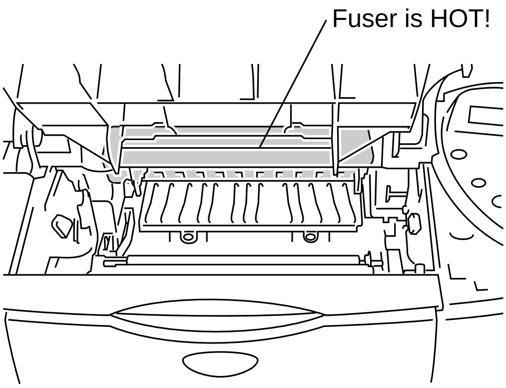


Figure 5-19

Clean the inside of the printer as follows:

1. Turn off the printer power switch, and then unplug the printer power cord.
2. Open the top cover.
3. Take out the drum unit assembly.

WARNING After you have just used the printer, some parts inside the printer are extremely hot. When you open the top cover of the printer, never touch the fuser and fixing roller.

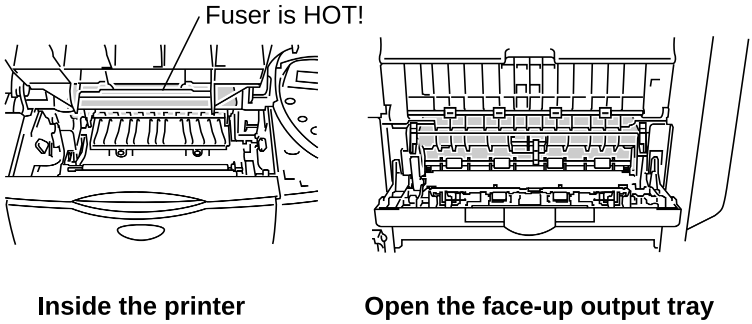


Figure 5-20

4 Wipe off toner and paper dust from the metal plate in the printer with a dry, soft cloth.

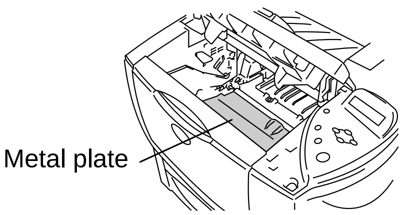


Figure 5-21

5 Wipe the scanner window with a dry, soft cloth.

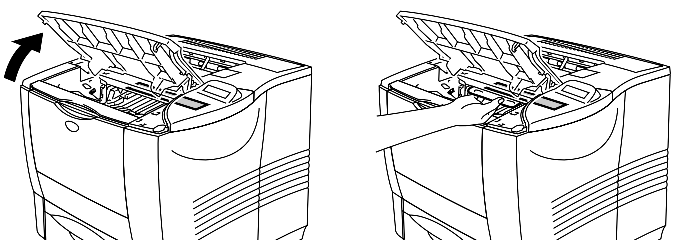


Figure 5-22

6 Put the drum unit assembly in the printer.

7 Close the top cover.

8 Plug the printer power cord back in, and then turn the printer power switch back on.

Cleaning the corona wire

If you are experiencing print quality problems, please clean the corona wire as follows:

1 Turn off the printer power switch, and then unplug the printer power cord.

2 Open the top cover.

3 Take out the drum unit assembly (drum unit with the toner cartridge).

- We recommend that you put the drum unit Assembly on a piece of disposable paper or cloth in case you accidentally spill the toner.
- To prevent damage to the printer from static electricity, do not touch the electrodes shown in Figure 5-23.

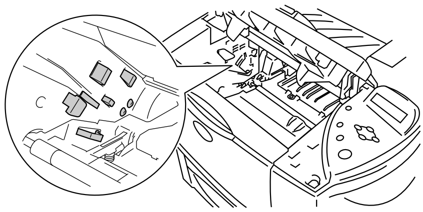


Figure 5-23

4 Clean the Primary Corona Wire inside the drum unit by gently sliding the blue tab from right to left several times.

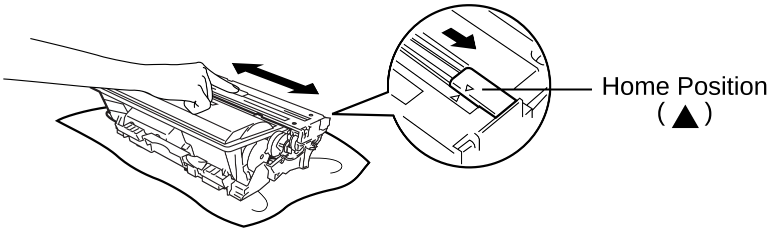


Figure 5-24

Make sure to return the tab to the Home position. If you do not, printed pages will have a black vertical stripe.

5 Put the drum unit assembly back in the printer.

6 Close the top cover.

7 Plug the printer power cord back in, and then turn the printer power switch back on.

Maintenance Messages

This printer will regularly prompt you to replace parts so you can rely upon it to maintain the best print quality.

LCD Message	Item	Approximate Life	To Purchase Replacement
REPLACE PF KIT MP	Paper feeding kit	100,000 pages *1	Call Customer Support
REPLACE PF KIT 1	Paper feeding kit	100,000 pages *1	Call Customer Support
REPLACE PF KIT 2	Paper feeding kit	100,000 pages *1	Call Customer Support
REPLACE PF KIT 3	Paper feeding kit	100,000 pages *1	Call Customer Support
REPLACE PF KIT 4	Paper feeding kit	100,000 pages *1	Call Customer Support
REPLACE FUSER	Fixing unit	200,000 pages *1	Call Customer Support
REPLACE LASER	Scanner unit	200,000 pages	Call Customer Support

*1 At 5% print coverage (A4 or Letter size). The actual number of printed pages will vary depending on the print jobs and paper you use.

6 Troubleshooting

LCD messages

The LCD names for the paper trays are as follows.

Upper paper tray	TRAY 1
Multi-purpose tray	MP TRAY
Optional Lower tray	TRAY 2, TRAY3, TRAY 4
Optional Duplex unit for Duplex printing	DX
Optional Mailbox unit	MX

Error messages

Error Message	Action
TONER LIFE END	Replace the toner cartridge with a new one. See *Replacing the toner cartridge in Chapter 5.*
CARTRIDGE ERROR	Take out the toner cartridge and put it back into the printer again. See *Replacing the toner cartridge in Chapter 5.*
NO PAPER XXX	Put paper in the empty tray.
NO TRAY XXX	Put the paper tray in the printer.
COVER OPEN	Close the top cover of the printer. Close the Duplex cover. Close the back cover of the mailbox.
FACEUP OPEN	Close the face-up output tray.
FACEUP CLOSE	Open the face-up output tray. Push down the two blue levers, and then press **Go**.
JAM XXX	Carefully pull out the jammed paper from the indicated area as shown in *Paper jams and how to clear them*.
STACKER FULL	Take some paper out of the output tray.
SIZE MISMATCH	Put the same size paper in the paper tray or multi-purpose tray that is selected in the printer driver, and then press **Go**.
TOO MANY TRAYS	You can only have up to three lower trays. Remove any extra lower trays.

Error Message	Action
MEDIATYPE ERROR	Specify the correct type of media.
MANUAL FEED	Put the same size of paper in the multi-purpose tray as is shown on the LCD. If the printer is 'paused', press **Go**.
SIZE ERROR XXX	Put the same size paper in the paper tray or multi-purpose tray that is selected in the printer driver. See *What kind of paper can I use? in Chapter 1.*
NO TRAY ID XXX	The tray you are trying to print to has been taken out. Put the tray back in the printer.
SIZE ERROR DX	Put the same size paper in the paper tray or multi-purpose tray that is selected in the printer driver. See *What kind of paper can I use? in Chapter 1.*
SIZE ERROR MX	Put the same size paper in the paper tray or multi-purpose tray that is selected in the printer driver. See *What kind of paper can I use? in Chapter 1.*
NO DX UNIT	Put the Duplex unit on the printer properly. See the User's Guide for the Duplex unit.
DX LEVER ERROR	Move the Duplex lever to the correct position.
NO MX UNIT	Change the job properties or install the Mailbox unit correctly.
DIMM ERROR	Re-install the DIMM correctly. Turn off the printer. Wait a few seconds, and then turn it on again. If this error message appears again, replace the DIMM with a new one.
CARD ERROR	Make sure of the following: ■ The CompactFlash card is installed properly. ■ The installed CompactFlash card is formatted properly Turn off the printer. Wait a few seconds, then turn it on again. If this error message appears again, replace the CompactFlash card with a newone.
HDD ERROR	Make sure of the following points: ■ The cable is connected correctly. ■ The HDD is installed correctly. ■ The installed HDD is formatted correctly. Turn off the printer. Wait a few seconds, then turn it on again. If this error message appears again, replace the HDD with a new one.
CARD REMOVAL	Turn off the printer. Wait a few seconds, then turn it on again. If this error message appears again, replace the CompactFlash card with a new one.
LINE ERROR	Check the serial interface settings (baud rate, code type, parity and handshake protocols).
BUFFER ERROR	Check the Interface settings.
STORAGE FULL	Delete unnecessary macros or fonts, or replace the CompactFlash card or HDD with a new one.

Error Message	Action
DOWNLOAD FULL	Add more memory. See *Installing extra DIMM memory in Chapter 4.*
FONT FULL	Add more memory. See *Installing extra DIMM memory in Chapter 4.*
MEMORY FULL	Add more memory. See *Installing extra DIMM memory in Chapter 4.*
IGNORE DATA	Add more memory. See *Installing extra DIMM memory in Chapter 4.*
ACCESSORY ERROR	The accessory you added was not installed properly.
OPTION MISMATCH	Your Duplex unit is not a DX-7000. Change to a DX-7000. Your Lower tray is not an LT-7000. Change to an LT-7000. Your Mailbox unit is not a MX-7000 series. Change to a MX-7000 series.
CLEAN DRUM UNIT	Open the top cover. Pull out the Drum unit assembly. Gently slide the blue tab across several times.

Maintenance messages

Maintenance message	Action
CHANGE DRUM SOON	The drum unit is almost at the end of life. Prepare a new drum unit. See *CHANGE DRUM SOON message in Chapter 5.*
TONER LOW	Purchase a new toner cartridge and have it ready before you get a TONER EMPTY message. To replace the toner cartridge, see *Chapter 5*.
TONER LIFE END	Replace the new toner cartridge referring to *Chapter 5*.
REPLACE PF KIT MP	Call your dealer for a replacement paper feeding kit.
REPLACE PF KIT1	Call your dealer for a replacement paper feeding kit.
REPLACE PF KIT2	Call your dealer for a replacement paper feeding kit.
REPLACE PF KIT3	Call your dealer for a replacement paper feeding kit.
REPLACE PF KIT4	Call your dealer for a replacement paper feeding kit.
REPLACE FUSER	Call your dealer for a replacement fuser unit.
REPLACE LASER	Call your dealer for a replacement laser unit.

Call service messages

Call service message	Action
ERROR ###	Turn off the printer. Wait a few seconds, then turn it on again. If this does not clear the problem, call your dealer or a Brother-authorized service representative.

Troubleshooting paper handling

First, make sure that you are using paper that meets our recommended paper specifications. See *What kind of paper can I use? in Chapter 1.*

Problem	Recommendation
The printer does not load paper.	■ If paper is in the paper tray, make sure it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over, and then put it back in the paper tray. ■ Reduce the amount of paper in the paper tray, and then try again. ■ Make sure that manual feed mode is not set in the printer driver. ■ The pickup roller or separation pad needs to be replaced. Please call your dealer for a replacement.
The printer does not load paper from the multi-purpose tray.	■ Fan the paper well and put it back in firmly. ■ Make sure you have chosen the manual feed mode in the printer driver.
The printer does not load envelopes.	■ The printer can load envelopes from the multi-purpose tray. You must set up your application software to print on the size of envelopes you are using. This is usually done in the page setup or document setup menu of your software. Please see your software application manual for instructions.
Envelope is creased after it is printed.	■ Open the face-up output tray, and push down the blue tabs that are at the left-hand and right-hand sides of the back of the printer.
There is a paper jam.	■ Clear the jammed paper (see *Paper jams and how to clear them*). ■ The pickup roller or separation pad needs to be replaced. Please call your dealer for a replacement.
The printer feeds multiple pages.	■ The pickup roller or separation pad needs to be replaced. Please call your dealer for a replacement.
The printer does not print to the face-down output tray.	■ Close the face-up output tray.

Problem	Recommendation
The printed pages are curled, so the face-down output tray cannot hold the maximum number of sheets.	■ Turn over the paper in the paper tray. ■ Change the printer driver setting in Media Type to a thicker setting.
The printer does not print.	■ Make sure that the cable is connected to the printer. ■ Make sure that you have chosen the appropriate printer driver.
When printing on normal paper, it creases.	■ Change the printer driver setting in Media to the Thin setting.

Paper jams and how to clear them

If paper jams inside the printer, the printer will stop. One of the following LCD messages will appear to tell you where to find the jammed paper.

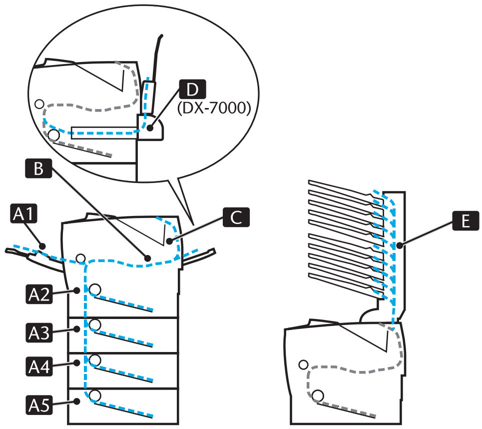


Figure 6-1

JAM A1	Paper jam in the multi-purpose tray
JAM A2	Paper jam in the upper paper tray (TRAY1)
JAM A3	Paper jam in the lower tray (TRAY 2)
JAM A4	Paper jam in the lower tray (TRAY 3)
JAM A5	Paper jam in the lower tray (TRAY 4)
JAM B	Paper jam inside the printer
JAM C	Paper jam where the paper comes out Paper jam in the face-up output tray
JAM D	Paper jam in the Duplex unit
JAM E	Paper jam in the Mailbox unit

Paper may jam in the paper tray, inside the printer, in the face-up output tray or where the paper comes out of the printer. Check where the jam is and follow the instructions below to remove the jammed paper.

If the error message still appears on the LCD after you remove the jammed paper, there may be more paper jammed somewhere else. Please check the printer thoroughly.

After you have removed all the jammed paper, open the top cover and then close it again to start printing.

If the paper is misfeeding or a lot of pages are going through at the same time when you print on small or thick paper, change the paper thickness switches that are on the bottom of the paper tray as follows.

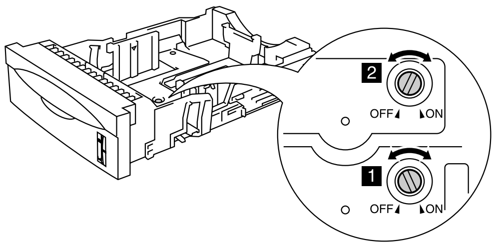


Figure 6-2

Other (Default setting)	Switch 1:ON Switch 2:OFF
A6	Switch 1:OFF Switch 2:OFF
A4 100 g/m^2 (27 lbs) Letter 105 g/m^2 (28 lbs) Legal 105 g/m^2 (28 lbs)	Switch 1:ON Switch 2:ON
Executive, A5, B6	Switch 1:OFF Switch 2:ON

Do not use the following:
- Bent paper
- Moist paper
- Paper that does not meet specifications

JAM A1 (paper jam in the multi-purpose tray)

```
JAM A1
```

If there is a paper jam in the multi-purpose tray, follow these steps:

1 Remove the paper from the multi-purpose tray.

2 Fan the paper stack, then put it back in the multi-purpose tray.

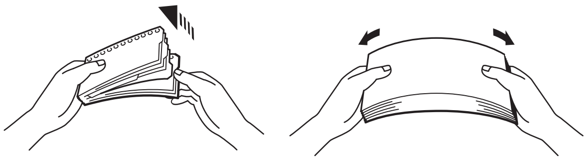


Figure 6-3

3 When loading paper in the multi-purpose tray, make sure it touches the back of the tray and stays below the maximum paper mark (▼).

4 Open the top cover of the printer and close it, or press **Go** to start printing.

JAM A2 / A3 / A4 / A5
(Paper jam inside the Paper tray)

The LCD names for the paper trays are as follows.

	Tray Name	LCD Panel Desctiption
Upper paper tray	Tray 1	A2
Optional Lower tray	Tray 2 Tray 3 Tray 4	A3 A4 A5

```
JAM A2
```

```
JAM A3
```

```
JAM A4
```

```
JAM A5
```

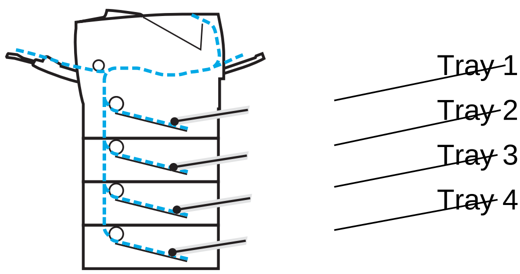


Figure 6-4

If a paper jam occurs inside the paper tray, follow these steps:

1 Pull the paper tray out of the printer.

2 Pull out the jammed paper.

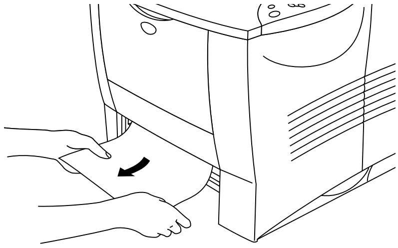


Figure 6-5



■ If you cannot pull out a small piece of jammed paper, you can remove it by turning the dial to the lower position, as shown below.

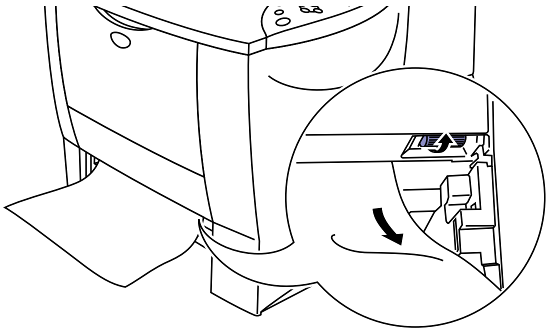


Figure 6-6

3 Load paper below the maximum paper mark (▼). While pressing the [blue] paper-guide release lever, slide the paper guides to fit the paper size. Check that the guides are firmly in the slots.

4 Put the paper tray back in the printer.

5 Open the top cover of the printer, and then close it to resume printing.

Do not pull out the upper paper tray while paper is feeding from a lower paper tray because this will cause a paper jam.

JAM B (paper jam inside the printer)

```
JAM B
```

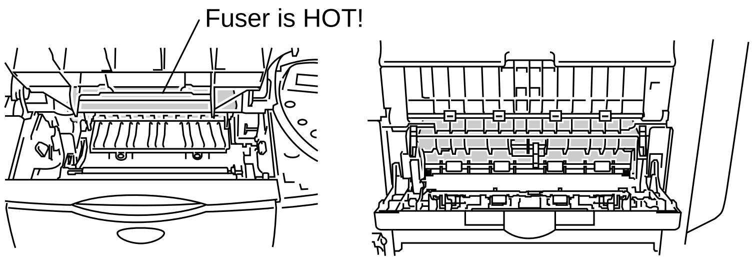
If a paper jam occurs inside the printer, follow these steps:

1 Open the top cover of the printer.

2 Take out the drum unit assembly (drum unit with the toner cartridge).

WARNING

- After you have just used the printer, some parts inside the printer are extremely hot.
- When you open the top cover of the printer, never touch the fuser or the fixing roller.



Inside the printer **Open the face-up output tray**

Figure 6-7

- After you have removed the jammed paper, print a few test pages. This is to make sure that the printed pages have no toner stains on them before you restart the print job.
- Remove the jammed paper carefully so you do not spread toner.
- Take care not to stain your hands and clothes with toner. Wash toner stains immediately with cold water.

3 Use both hands to slowly pull out the jammed paper from inside the printer.

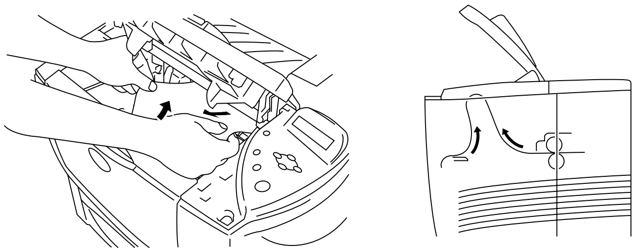


Figure 6-8

4 Push down the blue lock lever of the drum unit assembly and take the toner cartridge out of the drum unit assembly. Remove a piece of jammed paper if there is any inside the drum unit.

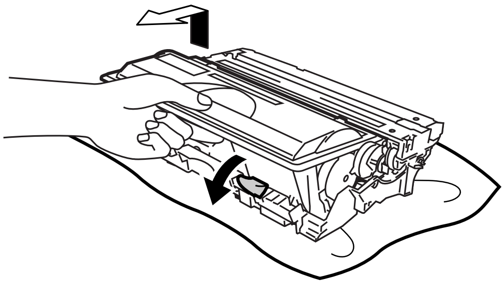


Figure 6-9

- Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.
- Do not touch the shaded parts shown in Figure 6-10 and 6-11.

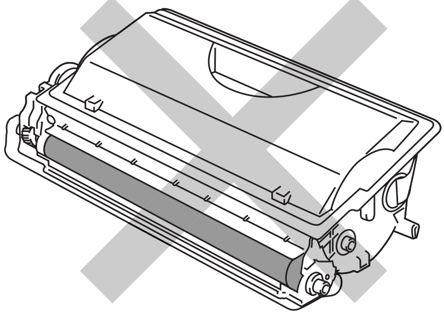


Figure 6-10

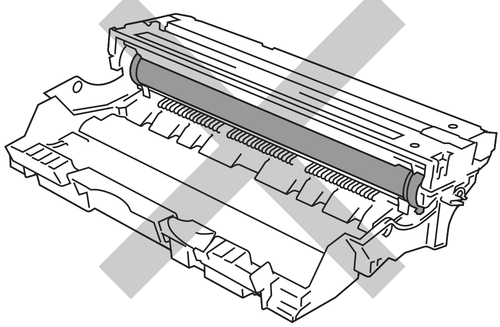


Figure 6-11

5 Put the drum unit assembly back in the printer (press firmly).

6 Close the top cover of the printer.

JAM C (paper jam where the paper comes out / paper jam in the face-up output tray)

```
JAM C
```

When the paper jams where the paper comes out or behind the face-up output tray, remove the jammed paper as follows:

1 Use both hands to slowly pull the jammed paper from the paper exit.

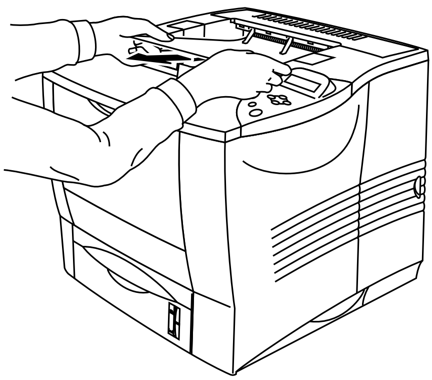


Figure 6-12



If a Duplex unit is on the printer, take it off the printer. After you pull out the jammed paper, put the Duplex unit back on the printer.

2 Open the face-up output tray.

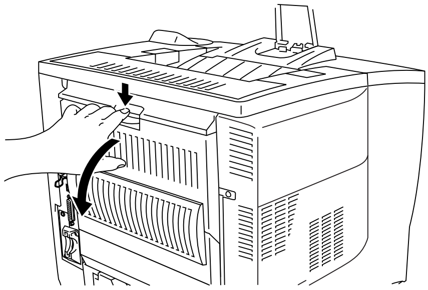


Figure 6-13

3 Use both hands to slowly pull out the jammed paper.

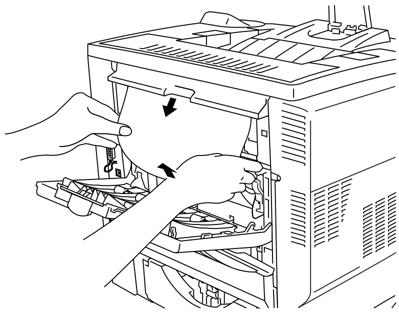


Figure 6-14

4 Close the face-up output tray.

5 Open the top cover of the printer, and then close it to resume printing.

JAM D (paper jam in the Duplex unit)

```
JAM D
```

1 Use both hands to slowly pull the jammed paper from the paper exit of the Duplex unit.

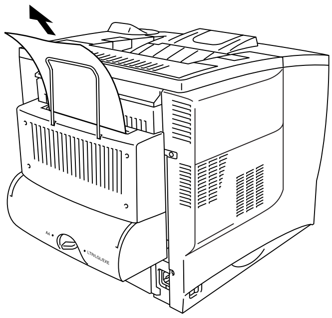


Figure 6-15

2 Use both hands to gently open the Duplex unit cover.

3 Use both hands to pull the Duplex unit out of the printer.

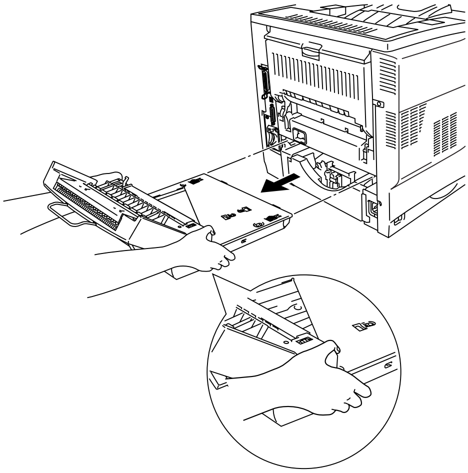


Figure 6-16

Look inside the printer's slot for the Duplex unit to make sure that the jammed paper is not in there.

When you pull out the Duplex unit, be sure to hold it firmly with both hands (the shaded part in the illustration is heavier).

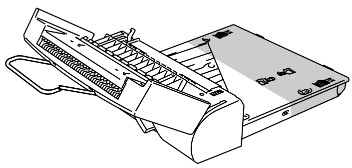


Figure 6-17

4 Pull out the jammed paper from inside the Duplex unit.

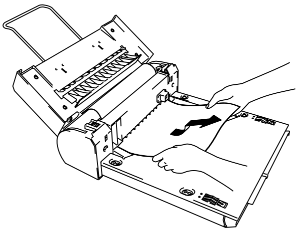


Figure 6-18

5 Put the Duplex unit back in the printer.

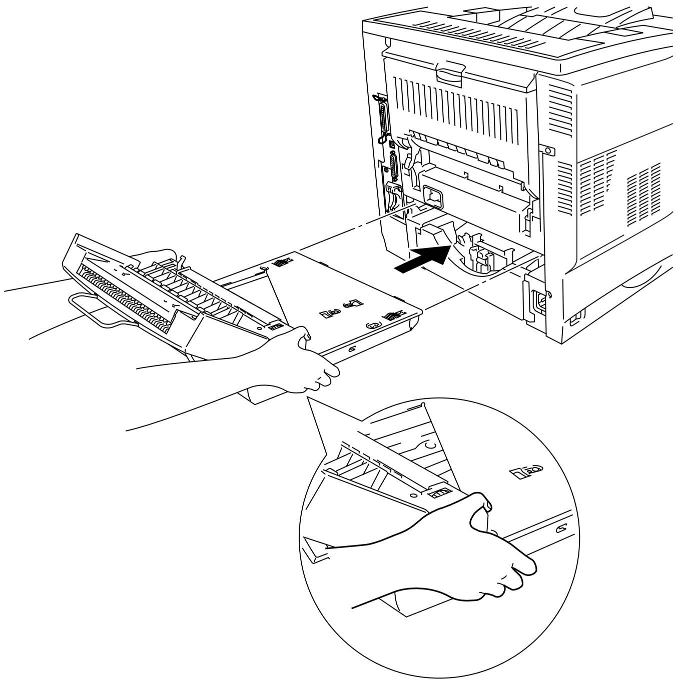


Figure 6-19

6 Gently close the Duplex unit cover.

JAM E (paper jam inside the mailbox unit)

```
JAM E
```

If there is a paper jam in the Mailbox unit, follow these steps:

1 Open the back cover of the Mailbox unit.

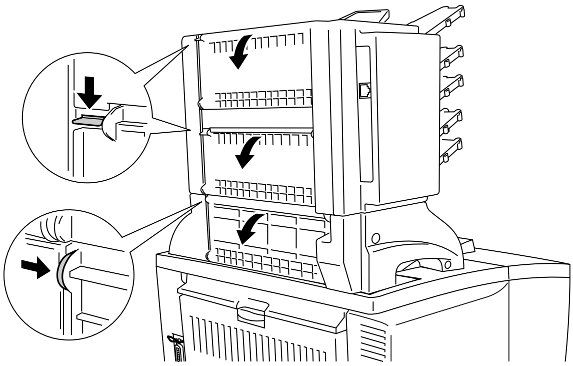


Figure 6-20

2 Pull out the jammed paper.

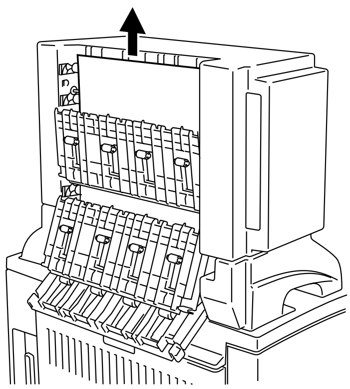


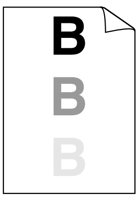
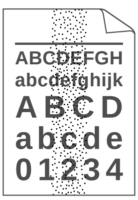
Figure 6-21

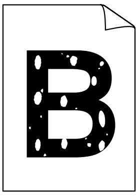
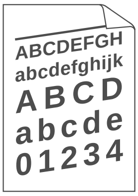
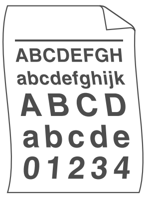
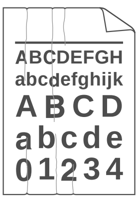
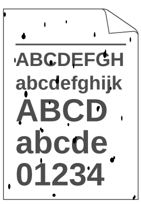
3 Close the back cover of the mailbox.

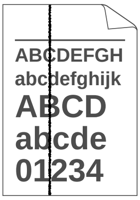
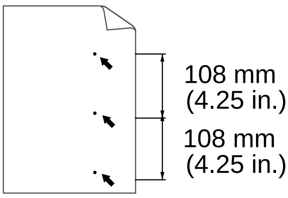
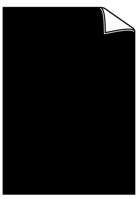
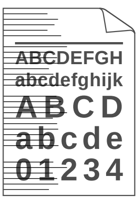
4 Open the top cover of the printer, and then close it to restart printing.

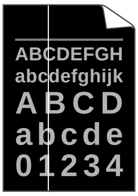
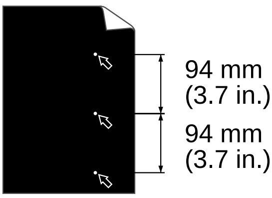
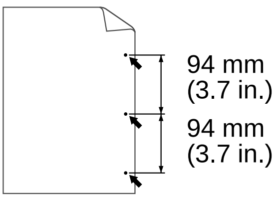
Improving the print quality

This section provides information on the following topics:

Examples of poor print quality	Recommendation
 **Faint print**	■ Check the printer's environment. Conditions such as humidity, high temperatures, and so on may cause this print fault. See *Positioning the printer in Chapter 1.* ■ If the whole page is too light, the Toner Save Mode may be on. Turn off Toner Save Mode in the printer Properties tab of the driver. ■ Try using a new toner cartridge. See *Replacing the toner cartridge in Chapter 5.* ■ You may clear the problem by wiping the scanner window with a soft cloth. *See Cleaning the inside of the printer* or the *Maintenance Tutorial* video on the supplied CD-ROM.
 **Grey background**	■ Make sure you use paper that meets the recommended specifications. See *What kind of paper can I use? in Chapter 1.* ■ Check the printer's environment - high temperatures and high humidity can increase the amount of background shading. See *Positioning the printer in Chapter 1.* ■ Use a new toner cartridge. See *Replacing the toner cartridge in Chapter 5.*
 **Ghost image**	■ Make sure you use paper that meets our specifications. Rough-surfaced paper, paper that has absorbed moisture, or thick paper can cause this problem. See *What kind of paper can I use? in Chapter 1.* ■ Make sure that you choose the appropriate media type in the printer driver. See *What kind of paper can I use? in Chapter 1.* ■ Try using a new toner cartridge. See *Replacing the toner cartridge in Chapter 5.* ■ Try using a new drum unit. See *Replacing the drum unit in Chapter 5.*
 **Toner specks**	■ Make sure that you use paper that meets our specifications. Rough-surfaced paper may cause the problem. See *What kind of paper can I use? in Chapter 1.* ■ The toner cartridge may be damaged. Put in a new toner cartridge. See *Replacing the toner cartridge in Chapter 5.* ■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*

Examples of poor print quality	Recommendation
 **Hollow print**	■ Make sure that you use paper that meets our specifications. See *What kind of paper can I use? in Chapter 1.* ■ Choose Thick paper mode in the printer driver, or use thinner paper than you are currently using. ■ Check the printer's environment because conditions such as high humidity can cause hollow print. See *Positioning the printer in Chapter 1.*
 **Page skewed**	■ Make sure the paper or other print media is loaded properly in the paper tray and that the guides are not too tight or too loose against the paper stack. ■ Set the paper guides correctly. Make sure that the tips of the paper guides fit firmly into the slots. See *Printing from the Paper tray in Chapter 1.* ■ If you are using the multi-purpose tray, see *Printing from the multi-purpose tray in Chapter 1.* ■ The paper tray may be too full. See *Printing from the Paper tray in Chapter 1.* ■ Check the paper type and quality. See *What kind of paper can I use? in Chapter 1.*
 **Curl or wave**	■ Check the paper type and quality. High temperatures and high humidity will cause paper to curl. See *What kind of paper can I use? in Chapter 1.* ■ If you don't use the printer very often, the paper may have been in the paper tray too long. Turn over the stack of paper in the paper tray. Also, try fanning the paper stack and then rotating the paper 180° in the paper tray.
 **Wrinkles or creases**	■ Make sure the paper is loaded properly. See *Printing from the Paper tray in Chapter 1.* ■ Check the paper type and quality. See *What kind of paper can I use? in Chapter 1.* ■ Turn over the stack of paper in the tray or try rotating the paper 180° in the input tray.
 **Poor fixing**	■ Make sure that the blue tabs in the rear cover are re-set by either closing the rear cover or pushing the blue tabs to their original position. See *Printing on envelopes in Chapter 1.*

Examples of poor print quality	Recommendation
 **Black lines down the page** Printed pages have toner stains stripes down the page.	■ The toner cartridge may be damaged. Put in a new toner cartridge. See *Replacing the toner cartridge in Chapter 5.* ■ You may clear the problem by cleaning the primary corona wire inside the drum unit by sliding the blue tab. Make sure to return the blue tab to the Home position (▼). See *Cleaning the corona wire in Chapter 5.*
 **Black spots** Black spots at 108 mm (4.25 in.) intervals.	■ Print the cleaning page. To print these two sheets, use the control panel Menu buttons to go to the INFORMATION menu and then to the MAINTENANCE menu to select CLEANING PAGE. If the black spots still appear, print the cleaning page again. *For more information, see Chapter 3*.
 **All black**	■ You may clear the problem by cleaning the primary corona wire inside the drum unit by sliding the blue tab. Make sure you return the blue tab to the Home position (▼). See *Cleaning the corona wire in Chapter 5.* ■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*
 **Lines across the page**	■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*

Examples of poor print quality	Recommendation
 **White lines down the page**	■ You may clear the problem by wiping the scanner window with a soft cloth. *See Cleaning the inside of the printer or the Maintenance Tutorial video on the supplied CD-ROM.*
 **Black toner marks across the page**	■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*
 **White Spots on black text and graphics at 94mm (3.7 in.) intervals**	■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*
 **Black spots at 94 mm (3.7 in.) intervals.**	■ The drum unit may be damaged. Put in a new drum unit. See *Replacing the drum unit in Chapter 5.*

Solving print problems

Problem	Recommendation
The printer prints unexpectedly or it prints garbage data.	■ Make sure the printer cable is not too long. We recommend that you use a parallel cable that is less than 1.8 metres (6 feet) long. ■ Make sure that the printer cable is not damaged or broken. ■ If you are using an interface-switching device, remove it. Connect your computer directly to your printer, and then try again. ■ Check that you have chosen the appropriate printer driver with 'Set as default'. ■ Make sure that the printer is not connected to the same port that is also connected to a storage device or scanner. Take away all other devices and connect the port only to the printer. ■ Turn off Printer Status reporting in the Device Options tab in the printer driver.
The printer cannot print full pages of a document.	■ Press the **Go** button to print the data that is left in the printer. ■ If the **Go** button does not clear the error, reduce the complexity of your document or reduce the print resolution. ■ Change the following settings in the supplied Windows® driver, and then try again. The best combination of the settings below will vary depending on your document. ■ Graphics mode ■ TrueType™ mode ■ Use printer TrueType™ fonts
The printer cannot print full pages of a document. An error message `MEMORY FULL` appears.	■ Press the **Go** button to print the data that is left in the printer. ■ Reduce the print resolution or reduce the complexity of your document. ■ Expand the printer memory by adding a DIMM. See *RAM expansion in Chapter 4.*
The headers or footers appear when I view my document on the screen but they do not show up when I print it.	■ Most laser printers have a restricted area that cannot be printed on. This 'unprintable area' is usually the first two lines and the last two lines of a page (leaving 62 printable lines). Adjust the top and bottom margins of your document to allow for this.
(For connecting and using the RS-232C interface only) The printer prints the first couple of pages properly, but some of the following pages have text missing.	■ This problem is usually related to serial interface settings. Your computer is not recognizing the printer input buffer's full signal. This could be caused by a wrong serial cable connection (cable is not wired properly or is too long) or by a wrong setup of your computer serial interface.

Other problems

Problem	Recommendation
The printer cannot print at all. Your PC shows the following error message: 'There was an error writing to LPT1: (or BRUSB) for the printer.'	■ Check that the printer cable is not damaged or broken. ■ If you have an interface-switching device, make sure that you choose the correct printer.

Printing with the serial interface

Problem	Recommendation
Cannot print from application software.	■ If you are using a serial interface, make sure that the slide switch of the serial interface is in the correct position. Make sure that the interface settings have been properly set up in the INTERFACE menu using the control panel.
(For connecting using the RS-232C interface only) The printer prints the first couple of pages correctly but some following pages have text missing.	■ This problem is usually related to serial interface settings. Your computer is not recognizing the printer input buffer's full signal. This could be caused by a wrong serial cable connection (cable is not wired properly or is too long) or a wrong setup of your computer serial interface.

Printing from DOS

Problem	Recommendation
Cannot print from application software	■ Check that the DOS application software interface settings match those of your printer. For example, if you are using a parallel printer cable, you would most likely set your DOS software printer port to LPT1. ■ Check if the printer has any printer alarms. ■ Check that you have chosen the appropriate printer in your application software. ■ If the serial interface is used, make sure that the RS-232C serial interface has been selected with the slide switch. Make sure the interface settings were correctly set up in INTERFACE menu using the control panel. Make sure the baud rate, parity and stop bits in your application software matches the settings in the printer.

Printer HDD (Hard Disk Drive)

Problem	Recommendation
Printer does not recognize the HDD.	Make sure that: ■ the cable is connected properly ■ the HDD is fitted properly ■ the HDD is formatted properly. Turn off the printer. Wait a few seconds, then turn it on again. If this error message appears again, replace the HDD with a new one.

BR-Script 3

Problem	Recommendation
The printer cannot print.	If IGNORE DATA appears on the LCD, please do the following: 1. Reset the printer. [Press - twice, then press **Set** twice and finally press **Go**.] 2. Turn off ERROR PRINT in BR-SCRIPT3 mode. [Press + five times, then press **Set** and then -, now press **Set** twice, select ERROR PRINT = OFF and press **Set** and finally press **Go**.] 3. If the printer prints out the error message page which says "ERROR NAME; limitcheck", add more memory. See *Installing extra DIMM memory in Chapter 4.*
The print speed slows down.	Add optional memory. See *Installing extra DIMM memory in Chapter 4.*
The printer cannot print EPS data.	You need the following settings to print EPS data: 1. In the Printer folder, select the printer you use. 2. Press the **Advanced** button on the PostScript tab. 3. Select 'Tagged binary communication protocol' in data format.

If you do not follow the instructions for using the printer, you may be responsible for all repairs.

Appendix

Printer specifications

Printing

Print method	Electrophotography by semiconductor laser-beam scanning	
Laser	Wave length: 780 nm Pulse duration: 17 ns Output: 15 mW max.	
Resolution	Windows® 95/98/Me, Windows NT® 4.0, Windows® 2000 and Windows® XP	1200 x 1200 dpi 600 x 600 dpi 300 x 300 dpi
	DOS	600 x 600 dpi
	Mac® OS	1200 x 1200 dpi 600 x 600 dpi 300 x 300 dpi
Print speed	28 pages per minute for Europe and other countries (1200, 600 or 300 dpi / A4 size) 30 pages per minute for USA and Canada (1200, 600 or 300 dpi / Letter size)	
Warm up	20 seconds at 23°C (68°F)	
First print	11 seconds or less (A4 or letter size using face-down printing from tray)	

Print media	■ Toner in a single cartridge Life Expectancy - Up to 12,000 single-sided pages (A4 or letter-size paper with the print density set at level 0 and about 5% coverage). ■ Drum unit Life Expectancy - Up to 40,000 single-sided pages (A4 or letter-size paper with the print density set at level 0 and about 5% coverage).
Resident printer fonts	■ HP LaserJet, EPSON FX-850, and IBM Proprinter XL modes - 66 scalable fonts and 12 bitmapped fonts ■ BR-Script® 3 mode - 66 scalable fonts (PostScript® 3 language emulation) For more information about resident fonts, see Resident *Fonts* in Appendix.

When the printer does not receive data for a certain period of time (timeout), it enters sleep mode. Sleep mode acts as though the printer is turned off. The default timeout is 30 minutes. You can change the setting at the control panel.

Functions

CPU	Toshiba TMPR 4955 266 MHz
Emulation	Automatic emulation selection ■ HP LaserJet 5 (PCL 6) (Hewlett-Packard laser printer-LaserJet) ■ BR-Script® 3 (PostScript® 3 language emulation) ■ HP-GL ■ EPSON FX-850 ■ IBM Proprinter XL
Interface	Automatic interface selection among bi-directional parallel, RS-232C serial and Universal Serial Bus.
RAM	HL-7050: 32 MB (expandable to 288 MB with two DIMMs) HL-7050N: 32 MB (expandable to 288 MB with two DIMMs) The factory installed standard memory varies depending on the printer model and country.
Control panel	Seven buttons, one LED, and one LCD that is a two-line, 16-column display with a three color back light.
Diagnostics	The printer has a program to diagnose any problems.

Options

Paper handling	Lower-tray unit (LT-7000) Maximum 500 sheets x 3 trays
	Duplex unit for duplex printing (DX-7000)
	Mailbox unit for output source (MX-7000 series)
Stabilizer	Stabilizer for safety after installing multiple optional devices on the printer (SB-4000)
Network connectivity	Ethernet 10BaseT/100BaseTX Print server (NC-4100h) (For HL-7050 only)
Storage device	Hard Disk Drive
	CompactFlash Card

Electrical and mechanical

Power source	USA and Canada: AC 110 to 120 V, 50/60 Hz Europe and Australia: AC 220 to 240 V, 50/60 Hz
Power consumption	Printing: 690 W or less*1 (when printing on plain paper) Stand-by: 110 W or less*1 Stand-by in sleep mode: 16 W or less*1 (after the fan stops) (activation time: 30 minutes) OFF: 1 W or less*2 *1 At 25°C (77°F) of room temperature. *2 The only way to achieve 0 W power is to unplug the printer from the power source.
Noise per ISO 9296	Printing: Lwad = about 67 dB (A) (see note below) Stand-by: Lwad = about 48 dB (A) (You might want to install printers with a sound power level of Lwad 63 dB (A) or more in a separate room or cubicle.)
Temperature	Operating: 10 to 32.5°C (50 to 90.5°F) Storage: 0 to 35°C (32 to 95°F).
Humidity	Operating: 20 to 80% (without condensation) Storage: 10 to 80% (without condensation)
Dimensions	485 (W) x 480 (H) x 421 (D) mm (19.1 x 18.9 x 16.6 in.)
Weight	Approximately 24.2 kg (53.4 lb)

Paper specifications

The LCD names for the paper trays are as follows.

Upper paper tray	TRAY1
Multi-purpose tray	MP TRAY
Optional Lower tray	TRAY 2, TRAY 3, TRAY 4
Optional Duplex unit for Duplex printing	DX
Optional Mailbox unit	MX

When looking at this page on the CD-ROM, you can jump to the page for each printing method by clicking the ⓘ in the table.

Media type	**Tray 1** 60 - 105 g/m² (16 - 28 lb)	**MP tray** 60 - 200 g/m² (16 - 53 lb)	**Tray 2/3/4** 60 - 105 g/m² (16 - 28 lb)	**DX** 60 - 105 g/m² (16 - 28 lb)	**MX** 60 - 105 g/m² (16 - 28 lb)	**Select this media type from the printer driver**
Plain paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	Plain paper
Recycled paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	Plain paper
Bond paper	ⓘ	ⓘ	ⓘ		ⓘ	Bond paper
Thick paper		ⓘ				Thick paper or thicker paper
Transparency		ⓘ A4 or Letter				Transparency
Labels		ⓘ A4 or Letter				Plain paper
Envelope		ⓘ				Envelope
Card stock		ⓘ				Thick paper or thicker paper
Thin paper	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	

When you print on thick paper, labels and card stock, we recommend that you select the media type setting in the printer driver according to the paper weight.

	Tray 1	MP tray	Tray 2/3/4
Paper size	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5, A6, B6	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5, A6, B6, COM-10, Monarch, C5, DL Width: 105 to 216 mm (4.13 to 8.5 in.) Height: 148.5 to 356 mm (5.85 to 14.0 in.)	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5
Number of sheets	500 sheets (80 g/m^2 or 20 lb)	100 sheets (80 g/m^2 or 20 lb) Transparencies: 10 sheets Envelopes: 10 sheets Label stock: 10 sheets	500 sheets (80 g/m^2 or 20 lb)

	DX	MX
Paper size	A4, Letter, Legal, B5 (JIS), Executive	A4, Letter, B5 (JIS), B5 (ISO), Executive
Number of sheets		100 sheets per bin (80 g/m^2 or 20 lb)

You must use the face-up output tray for certain print media.

When looking at this page on the CD-ROM, you can jump to the page for each printing method by clicking the ⓘ in the table.

Media type	Face-down	Face-up	Notes
Plain paper	ⓘ	ⓘ	60 g/m^2 to 105 g/m^2 (16 to 28 lb)
Recycled paper	ⓘ	ⓘ	
Bond paper	ⓘ	ⓘ	
Thick paper	ⓘ	ⓘ	105 g/m^2 to 150 g/m^2 (28 to 40 lb)
Thicker paper	ⓘ	ⓘ	150 g/m^2 to 200 g/m^2 (40 to 53 lb)
Transparency	ⓘ	ⓘ	Overhead projector film
Labels		ⓘ	
Envelope		ⓘ	
Card stock		ⓘ	
Thin paper	ⓘ	ⓘ	

You can use the control panel Menu buttons to select the priority of the paper source in the PAPER menu. For more information about this setting, see *Chapter 3*.

- If you print on thick paper that weighs more than 150 g/m^2 (40 lb), use face-up printing.
- We recommend that you use face-up printing when you print on transparencies.
- If the paper is misfeeding or a lot of pages go through at the same time when you print on small or thick paper, change the paper thickness switches on the bottom of the paper tray. *For more information, see page 1-22*.

Media types in the driver settings

You can select the following media types in the driver settings. Please see, Features in the printer driver in *Chapter 2*.

- Plain paper: 60 g/m^2 to 105 g/m^2 (16 lb to 28 lb)
- Thick paper: 105 g/m^2 to 150 g/m^2 (28 lb to 40 lb)
- Thicker paper: 150 g/m^2 to 200 g/m^2 (40 lb to 53 lb)
- Bond paper: Rough paper - 60 g/m^2 to 200 g/m2 (16 lb to 53 lb)
- Transparency: Overhead projector film
- Envelope
- Thin paper

Recommended paper

Plain Paper	Xerox Premier 80 g/m^2 Xerox 4200DP 20 lb
Recycled Paper	Xerox Recycled Supreme 80 g/m^2
Transparency	3M CG3300
Label	Avery laser label #L7163 Avery laser label #5160

- Before you buy a lot of paper, please test a page to make sure that the paper is suitable.
- Use paper that is designed for plain-paper copying.
- Use paper that is 75 to 90 g/m^2 (20 to 24 lb).
- Use neutral paper. Do not use acidic or alkaline paper.
- Use long-grain paper.
- Use paper with a moisture content of approximately 5%.
- This printer can use recycled paper that meets the DIN 19309 specification.

Fonts

66 scalable and 12 bitmapped fonts

This printer has the following scalable fonts and bitmapped fonts. The fonts that can be used will vary according to your emulation mode.

HP LaserJet, EPSON FX-850 and IBM Proprinter XL Modes

Scalable fonts:

Intellifont Compatible Fonts

- Alaska, Extrabold
- Antique Oakland, Oblique, Bold
- Brougham, Oblique, Bold, BoldOblique
- Cleveland Condensed
- Connecticut
- Guatemala Antique, Italic, Bold, BoldItalic
- Letter Gothic, Oblique, Bold
- Maryland
- Oklahoma, Oblique, Bold, BoldOblique
- PC Brussels Light, LightItalic, Demi, DemiItalic
- PC Tennessee Roman, Italic, Bold, BoldItalic
- Utah, Oblique, Bold, BoldOblique
- Utah Condensed, Oblique, Bold, BoldOblique

Microsoft® Windows® 95/98/Me, Windows® 2000 and Windows NT®TrueType compatible fonts:

- BR Symbol
- Helsinki, Oblique, Bold, BoldOblique
- Tennessee Roman, Italic, Bold, BoldItalic
- Dingbats

Type 1 Font compatible fonts:

- Atlanta Book, BookOblique, Demi, DemiOblique
- Calgary MediumItalic
- Copenhagen Roman, Italic, Bold, BoldItalic
- Portugal Roman, Italic, Bold, BoldItalic

Brother Original Fonts:

- Bermuda Script
- Germany
- San Diego
- US Roman

Bitmapped fonts (portrait and landscape):

- LetterGothic16.66 Medium, Italic, Bold, BoldItalic
- OCR-A
- OCR-B

66 scalable fonts

BR-Script 3 Mode

Scalable fonts

- Atlanta Book, BookOblique, Demi, DemiOblique
- Alaska, Extrabold
- Antique Oakland, Oblique, Bold
- Bermuda Script
- BR Dingbats
- BR Symbol
- Brougham, Oblique, Bold, BoldOblique
- Brussels Light, LightItalic, Demi, DemiItalic
- Calgary MediumItalic
- Cleveland Condensed
- Connecticut
- Copenhagen Roman, Italic, Bold, BoldItalic
- Germany
- Guatemala Antique, Italic, Bold, BoldItalic
- Helsinki, Oblique, Bold, BoldOblique
- Helsinki Narrow, Oblique, Bold, BoldOblique
- Letter Gothic, Oblique, Bold
- Maryland
- Oklahoma, Oblique, Bold, Bold Oblique
- Portugal Roman, Italic, Bold, BoldItalic
- San Diego
- Tennessee Roman, Italic, Bold, BoldItalic
- US Roman
- Utah, Oblique, Bold, BoldOblique
- Utah Condensed, Oblique, Bold, BoldOblique

Symbol and character sets

For the HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes, you can select the symbol and character sets in the PRINT MENU. See About emulation modes in *Chapter 3*.

If you have chosen the HP-GL emulation menu, you can choose the standard or alternate character set in the PRINT MENU. See *PRINT MENU*, Chapter 3.

OCR symbol Sets

When you choose the OCR-A or OCR-B font, the matching symbol set is always used.

OCR-A

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5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
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OCR-B

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Roman 8 (8U)

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ISO Latin1 (0N)

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ISO Latin5 (5N)

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ISO Latin6 (6N)

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PC-8 (10U)

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PC-8 D/N (11U)

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PC-850 (12U)

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PC-852 (17U)

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6	♠	▬	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
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9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
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B	♂	←	+	;	K	[	k	{	ő	Ť	ź	╗	╦	█	Ű	ű
C	♀	∟	,	<	L	\	l	|	î	ť	Č	╝	╠	▄	ý	Ř
D	♪	↔	-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
E	♫	▲	.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	■
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PC-775 (26U)

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1	☺	◄	!	1	A	Q	a	q	ü	æ	Ī	▒	┴	č	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	ę	Ō	“
3	♥	‼	#	3	C	S	c	s	ā	ō	Ż	│	├	ė	Ń	¾
4	♦	¶	$	4	D	T	d	t	ä	ö	ż	┤	─	į	õ	¶
5	♣	§	%	5	E	U	e	u	ģ	Ģ	ź	Ą	┼	š	Õ	§
6	♠	▬	&	6	F	V	f	v	å	¢	”	Č	Ų	ų	µ	÷
7	•	↨	'	7	G	W	g	w	ć	Ś	¦	Ę	Ū	ū	ń	„
8	◘	↑	(	8	H	X	h	x	ł	ś	©	Ė	╚	ž	Ķ	°
9	○	↓	)	9	I	Y	i	y	ē	Ö	®	╣	╔	┘	ķ	∙
A	◙	→	*	:	J	Z	j	z	Ŗ	Ü	¬	║	╩	┌	Ļ	·
B	♂	←	+	;	K	[	k	{	ŗ	ø	½	╗	╦	█	ļ	¹
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PC-1004 (9J)

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2			"	2	B	R	b	r	‚	’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s		“	£	³	Ã	Ó	ã	ó
4	ˉ		$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5	˘		%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6	˙		&	6	F	V	f	v	†	–	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8	˚		(	8	H	X	h	x	ˆ	˜	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A	˝		*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B	˛		+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
C	ˇ		,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
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PC-8 Turkish (9T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	Ğ	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	ğ	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	İ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ı	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ş	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ş	»	┐	╧	▀	∩	

Windows Latin1 (19U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r	‚	’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s	ƒ	“	£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	–	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	ˆ	˜	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
C			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	░		Ÿ	¯	¿	Ï	ß	ï	ÿ

Windows Latin2 (9E)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1			!	1	A	Q	a	q		‘	ˇ	±	Á	Ń	á	ń
2			"	2	B	R	b	r	‚	’	˘	˛	Â	Ň	â	ň
3			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	ĺ	ő
6			&	6	F	V	f	v	†	–	¦	¶	Ć	Ö	ć	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F			/	?	O	_	o	░	Ź	ź	Ż	ż	Ď	ß	ď	˙

Windows Latin5 (5T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r	‚	’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s	ƒ	“	£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	–	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	ˆ	˜	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
C			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	İ	í	ı
E			.	>	N	^	n	~			®	¾	Î	Ş	î	ş
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Windows Baltic (19L)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1			!	1	A	Q	a	q		‘		±	Į	Ń	į	ń
2			"	2	B	R	b	r	‚	’	¢	²	Ā	Ņ	ā	ņ
3			#	3	C	S	c	s		“	£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ō	ä	ō
5			%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	–	¦	¶	Ę	Ö	ę	ö
7			'	7	G	W	g	w	‡	—	§	·	Ē	×	ē	÷
8			(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A			*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B			+	;	K	[	k	{	‹	›	«	»	Ė	Ū	ė	ū
C			,	<	L	\	l	|			¬	¼	Ģ	Ü	ģ	ü
D			-	=	M	]	m	}	¨	¯	-	½	Ķ	Ż	ķ	ż
E			.	>	N	^	n	~	ˇ	˛	®	¾	Ī	Ž	ī	ž
F			/	?	O	_	o	░	¸		Æ	æ	Ļ	ß	ļ	˙

Legal (1U)

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1			!	1	A	Q	a	q								
2			″	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			′	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	§								
C			,	‗	L	®	l	¶								
D			-	=	M	]	m	†								
E			.	¢	N	©	n	™								
F			/	?	O	_	o	░								

Ventura Math (6M)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	≅	Π	‾	π			◇	®	≤	↓	│	∏
1			!	1	Α	Θ	α	θ			√	⊃	♦	←	·	™
2			∀	2	Β	Ρ	β	ρ			⎣	⊇	≥	®	∠	⇐
3			#	3	Χ	Σ	χ	σ			⎡	⌠	∂	″	⌋	⇔
4			∃	4	Δ	Τ	δ	τ			⎢		ℵ	ƒ		∨
5			%	5	Ε	Υ	ε	υ			⎣	♣	′	ℑ	⎨	∑
6			&	6	Φ	ς	ϕ	ϖ			⎢	⊕	ℜ	©	⎧	™
7			∍	7	Γ	Ω	γ	ω			│	⊗	℘	±	〉	│
8			(	8	Η	Ξ	η	ξ			⇑	⊆	∞	→		⌋
9			)	9	Ι	Ψ	ι	ψ			⇒	∪	♠	↑	¬	∅
A			∗	:	ϑ	Ζ	φ	ζ			⇓	—	∝	≠	∇	∩
B			+	;	Κ	[	ϰ	{		↵	⊄	…	•	≡	⎧	∈
C			,	<	Λ	∴	λ	|		→	⊂	│	/	°	⎪	©
D			−	=	Μ	]	μ	}		␣	⌡	∧	♥	↔	⎥	∉
E			.	>	Ν	⊥	ν	~		▪	│	↵	×	⎤	⎭	⎤
F			/	?	Ο	_	ο			□	⎬	≈	ϒ	⌠	÷	〈

Ventura Intl (13J)

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1			!	1	A	Q	a	q			À	‟	ê	î	Ã	œ
2			"	2	B	R	b	r			Â	″	ô	Ø	ã	¶
3			#	3	C	S	c	s			È	°	û	Æ		†
4			$	4	D	T	d	t			Ê	Ç	á	å		‡
5			%	5	E	U	e	u			Ë	ç	é	í	Í	—
6			&	6	F	V	f	v			Î	Ñ	ó	ø	Ì	–
7			′	7	G	W	g	w			Ï	ñ	ú	æ	Ó	
8			(	8	H	X	h	x			©	¡	à	Ä	Ò	
9			)	9	I	Y	i	y			®	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z			™	¤	ò	Ö	õ	º
B			+	;	K	[	k	{		↵	‹	£	ù	Ü	Š	«
C			,	<	L	\	l	|		→	›	¥	ä	É	š	•
D			-	=	M	]	m	}		␣	Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~		▪	Û	ƒ	ö	ß	Ÿ	
F			/	?	O	_	o			□		¢	ü	Ô	ÿ	…

Ventura US (14J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p			„	‰				
1			!	1	A	Q	a	q				‟				
2			"	2	B	R	b	r				″				¶
3			#	3	C	S	c	s				°				†
4			$	4	D	T	d	t								‡
5			%	5	E	U	e	u								—
6			&	6	F	V	f	v								–
7			′	7	G	W	g	w								
8			(	8	H	X	h	x			©					
9			)	9	I	Y	i	y			®					
A			*	:	J	Z	j	z			™					
B			+	;	K	[	k	{		↵						
C			,	<	L	\	l	|		→						•
D			-	=	M	]	m	}		␣		§				
E			.	>	N	^	n	~		▪						
F			/	?	O	_	o			□		¢				…

PS Math (5M)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
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1			!	1	Α	Θ	α	θ			ϒ	±	ℑ	∇	〈	〉
2			∀	2	Β	Ρ	β	ρ			′	″	ℜ	®	®	∫
3			#	3	Χ	Σ	χ	σ			≤	≥	℘	©	©	⌠
4			∃	4	Δ	Τ	δ	τ			⁄	×	⊗	™	™	⎮
5			%	5	Ε	Υ	ε	υ			∞	∝	⊕	∏	∑	⌡
6			&	6	Φ	ς	ϕ	ϖ			ƒ	∂	∅	√	⎛	⎞
7			∍	7	Γ	Ω	γ	ω			♣	•	∩	⋅	⎜	⎟
8			(	8	Η	Ξ	η	ξ			♦	÷	∪	¬	⎝	⎠
9			)	9	Ι	Ψ	ι	ψ			♥	≠	⊃	∧	⎡	⎤
A			∗	:	ϑ	Ζ	φ	ζ			♠	≡	⊇	∨	⎢	⎥
B			+	;	Κ	[	κ	{			↔	≈	⊄	⇔	⎣	⎦
C			,	<	Λ	∴	λ	|			←	…	⊂	⇐	⎧	⎫
D			−	=	Μ	]	μ	}			↑	⏐	⊆	⇑	⎨	⎬
E			.	>	Ν	⊥	ν	∼			→	⎯	∈	⇒	⎩	⎭
F			/	?	Ο	_	ο				↓	↵	∉	⇓	⎪	

PS Text (10J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p						—		
1			!	1	A	Q	a	q			¡	–	`		Æ	æ
2			"	2	B	R	b	r			¢	†	´			
3			#	3	C	S	c	s			£	‡	ˆ		ª	
4			$	4	D	T	d	t			⁄	·	˜			
5			%	5	E	U	e	u			¥		¯			ı
6			&	6	F	V	f	v			ƒ	¶	˘			
7			’	7	G	W	g	w			§	•	˙			
8			(	8	H	X	h	x			¤	‚	¨		Ł	ł
9			)	9	I	Y	i	y			'	„			Ø	ø
A			*	:	J	Z	j	z			“	”	˚		Œ	œ
B			+	;	K	[	k	{			«	»	¸		º	ß
C			,	<	L	\	l	|			‹	…				
D			-	=	M	]	m	}			›	‰	˝			
E			.	>	N	^	n	~			fi		˛			
F			/	?	O	_	o				fl	¿	ˇ			

Math-8 (8M)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	∴	Π	∵	π				‾	⊕	Å	⎡	⎤
1			√	1	Α	Ρ	α	ρ			↑	∀	⊙	⊣	⎣	⎦
2			″	2	Β	Σ	β	σ			→	∃	⊗	⊢	⎧	⎫
3			°	3	Γ	Τ	γ	τ			↓	⊤	⊖	⌊	⎨	⎬
4			∞	4	Δ	Υ	δ	υ			←	⊥	⊘	∍	⎩	⎭
5			÷	5	Ε	Φ	ϵ	ϕ			⇑	∪	∧	∫	⌠	⎪
6			∝	6	Ζ	Χ	ζ	χ			⇒	∩	∨	∮	ϕ	
7			′	7	Η	Ψ	η	ψ			⇓	∈	⊻	∠	⌡	√
8			(	8	Θ	Ω	θ	ω			⇐	∋	¬	∅	╲	⌝
9			)	9	Ι	∇	ι	ϑ			↕	∉	∘	ℵ	‖	〉
A			×	e	Κ	∂	κ	φ			↔	⊂	·	ℶ	∠	⌟
B			+	ε	Λ	ς	λ	ϖ			⇕	⊃	•	ℷ	╱	╲
C			,	<	Μ	≤	μ	≃			⇔	⊄	●	ℭ	—	〈
D			−	=	Ν	≠	ν	≡			⇄	⊅	○	ℑ	═	∓
E			.	>	Ξ	≥	ξ	≢			⇆	⊆	†	ℜ	∗	±
F			/	≈	Ο	_	ο	▒				⊇	‡	ℨ	≅	

Pi Font(15U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				¯	∷	𝒫	┌	┐								
1				˘	▵	℘	└	┘								
2			″	ˇ		℞	⎛	⎞								
3			‚	˙		∑	⎝	⎠								
4			"	↗			┼	┬								
5			″	↘			├	┤								
6			`	↙	F		─	┴								
7			´	↖			‖	│								
8			⟨	▵	ℏ		⋃	⊔								
9			⟩	▹			⋂	⊓								
A			™	▿			⟦	⟧								
B			℠	◃		⟦	⟦	⟧								
C			®	◄	ℒ	‖	□	■								
D			©	§	ℓ	⟧	◇	◆								
E			Ⓜ	►		‹										
F				¶		›		▒								

MS Publishing (6J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0					²		`					°			Ω	
1			¹								‘	•	`	`		
2			″			℞					″	•	´	´		
3			³			Š	%	š			^	●	ˆ	ˆ		
4			⁴			™					~	◦	˜	˜		
5			⁵									○	¯	¯		ı
6			⁷									○	˘	˘	Ĳ	ĳ
7			′									▪	˙	˙	Ŀ	ŀ
8			⁹									■	¨	¨	Ł	ł
9			⁰			Ÿ					ﬁ	■				
A			⁸			Ž		ž			ﬂ	▫	˚	˚		
B			†								ﬀ	□	¸	¸		
C			‚	„	Ľ		ℓ				ﬃ	□				
D			–	‡	—						ﬄ	‰	˝	˝		
E			…		–	⁶		‶		₧	‹	◆	˛	˛		
F			⁄		Œ	‗	œ			ƒ	›	◇	ˇ	ˇ	ŉ	

Windows 3.0 (9U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Đ	à	ð
1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r		’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒			¯	¿	Ï	ß	ï	ÿ

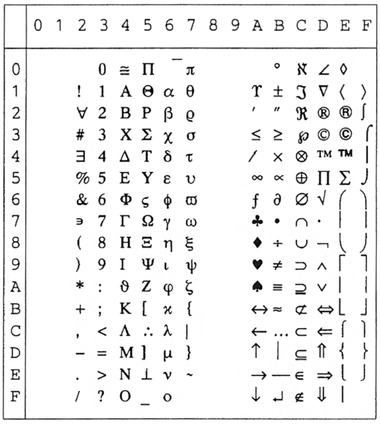
Desktop (7J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				“	–	‹	ª	´
1			!	1	A	Q	a	q			¶	”	±	›	º	`
2			"	2	B	R	b	r			§	µ	×	«	æ	ˆ
3			#	3	C	S	c	s			†	‰	÷	»	Æ	¨
4			$	4	D	T	d	t			‡	•	°	‚	ð	˜
5			%	5	E	U	e	u			©	●	′	„	Đ	ˇ
6			&	6	F	V	f	v			®	◦	″	·	ĳ	˘
7			′	7	G	W	g	w			™	○	¼	¡	Ĳ	˝
8			(	8	H	X	h	x			℅	▪	½	¿	ł	˚
9			)	9	I	Y	i	y			¢	■	¾	₧	Ł	˙
A			*	:	J	Z	j	z			–	▫	¹	ℓ	œ	¯
B			+	;	K	[	k	{			—	□	²	£	Œ	¸
C			,	<	L	\	l	|			…	'	³	¥	ø	˛
D			-	=	M	]	m	}			ﬁ	¬	⁄	¤	Ø	·
E			.	>	N	^	n	~			ﬂ	¦		ƒ	þ	ı
F			/	?	O	_	o	▒				‗		ß	Þ	

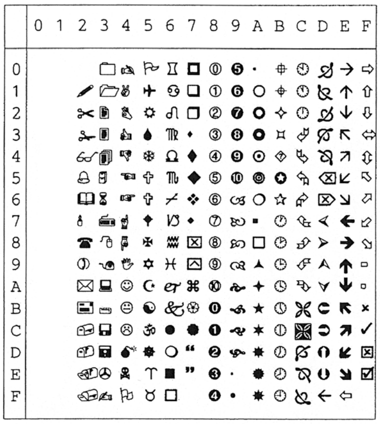
MC Text (12J)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ä	ê	†	∞	¿	–	‡	
1			!	1	A	Q	a	q	Å	ë	°	±	¡	—	·	Ò
2			"	2	B	R	b	r	Ç	í	¢	≤	¬	“	‚	Ú
3			#	3	C	S	c	s	É	ì	£	≥	√	”	„	Û
4			$	4	D	T	d	t	Ñ	î	§	¥	ƒ	‘	‰	Ù
5			%	5	E	U	e	u	Ö	ï	•	µ	≈	’	Â	ı
6			&	6	F	V	f	v	Ü	ñ	¶	∂	∆	÷	Ê	ˆ
7			'	7	G	W	g	w	á	ó	ß	∑	«	◊	Á	˜
8			(	8	H	X	h	x	à	ò	®	∏	»	ÿ	Ë	¯
9			)	9	I	Y	i	y	â	ô	©	π	…	Ÿ	È	˘
A			*	:	J	Z	j	z	ä	ö	™	∫		⁄	Í	˙
B			+	;	K	[	k	{	ã	õ	´	ª	À	¤	Î	˚
C			,	<	L	\	l	|	å	ú	¨	º	Ã	‹	Ï	¸
D			-	=	M	]	m	}	ç	ù	≠	Ω	Õ	›	Ì	˝
E			.	>	N	^	n	~	é	û	Æ	æ	Œ	ﬁ	Ó	˛
F			/	?	O	_	o		è	ü	Ø	ø	œ	ﬂ	Ô	ˇ

Symbol (19M)



Wingdings (579L)



The following table shows characters that are only available in the matching character set. The numbers at the top of the table are hexadecimal code values so that characters will be replaced with the Roman 8 character set. For other characters, see the Roman 8 character set.

<table>
<tr><th>SYMBOL SET</th><th></th><th>23</th><th>24</th><th>40</th><th>5B</th><th>5C</th><th>5D</th><th>5E</th><th>60</th><th>7B</th><th>7C</th><th>7D</th><th>7E</th></tr>
<tr><td>ISO2 IRV</td><td><ESC>(2U</td><td>#</td><td>¤</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>‾</td></tr>
<tr><td>ISO4 UK</td><td><ESC>(1E</td><td>£</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>‾</td></tr>
<tr><td>ISO6 ASCII</td><td><ESC>(0U</td><td>#</td><td>$</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>~</td></tr>
<tr><td>ISO10 Swedish</td><td><ESC>(3S</td><td>#</td><td>¤</td><td>@</td><td>Ä</td><td>Ö</td><td>Å</td><td>^</td><td>`</td><td>ä</td><td>ö</td><td>å</td><td>‾</td></tr>
<tr><td>ISO11 Swedish</td><td><ESC>(0S</td><td>#</td><td>¤</td><td>É</td><td>Ä</td><td>Ö</td><td>Å</td><td>Ü</td><td>é</td><td>ä</td><td>ö</td><td>å</td><td>ü</td></tr>
<tr><td>ISO14 JIS ASCII</td><td><ESC>(0K</td><td>#</td><td>$</td><td>@</td><td>[</td><td>¥</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>‾</td></tr>
<tr><td>ISO15 Italian</td><td><ESC>(0I</td><td>£</td><td>$</td><td>§</td><td>°</td><td>ç</td><td>é</td><td>^</td><td>ù</td><td>à</td><td>ò</td><td>è</td><td>ì</td></tr>
<tr><td>ISO16 Portuguese</td><td><ESC>(4S</td><td>#</td><td>$</td><td>§</td><td>Ã</td><td>Ç</td><td>Õ</td><td>^</td><td>`</td><td>ã</td><td>ç</td><td>õ</td><td>°</td></tr>
<tr><td>ISO17 Spanish</td><td><ESC>(2S</td><td>£</td><td>$</td><td>§</td><td>¡</td><td>Ñ</td><td>¿</td><td>^</td><td>`</td><td>°</td><td>ñ</td><td>ç</td><td>~</td></tr>
<tr><td>ISO21 German</td><td><ESC>(1G</td><td>#</td><td>$</td><td>§</td><td>Ä</td><td>Ö</td><td>Ü</td><td>^</td><td>`</td><td>ä</td><td>ö</td><td>ü</td><td>ß</td></tr>
<tr><td>ISO25 French</td><td><ESC>(0F</td><td>£</td><td>$</td><td>à</td><td>°</td><td>ç</td><td>§</td><td>^</td><td>`</td><td>é</td><td>ù</td><td>è</td><td>¨</td></tr>
<tr><td>ISO57 Chinese</td><td><ESC>(2K</td><td>#</td><td>¥</td><td>@</td><td>[</td><td>\</td><td>]</td><td>^</td><td>`</td><td>{</td><td>|</td><td>}</td><td>‾</td></tr>
<tr><td>ISO60 Norwegian1</td><td><ESC>(0D</td><td>#</td><td>$</td><td>@</td><td>Æ</td><td>Ø</td><td>Å</td><td>^</td><td>`</td><td>æ</td><td>ø</td><td>å</td><td>‾</td></tr>
<tr><td>ISO61 Norwegian2</td><td><ESC>(1D</td><td>§</td><td>$</td><td>@</td><td>Æ</td><td>Ø</td><td>Å</td><td>^</td><td>`</td><td>æ</td><td>ø</td><td>å</td><td>|</td></tr>
<tr><td>ISO69 French</td><td><ESC>(1F</td><td>£</td><td>$</td><td>à</td><td>°</td><td>ç</td><td>§</td><td>^</td><td>µ</td><td>é</td><td>ù</td><td>è</td><td>¨</td></tr>
<tr><td>ISO84 Portuguese</td><td><ESC>(5S</td><td>#</td><td>$</td><td>´</td><td>Ã</td><td>Ç</td><td>Õ</td><td>^</td><td>`</td><td>ã</td><td>ç</td><td>õ</td><td>~</td></tr>
<tr><td>ISO85 Spanish</td><td><ESC>(6S</td><td>#</td><td>$</td><td>·</td><td>¡</td><td>Ñ</td><td>Ç</td><td>¿</td><td>`</td><td>´</td><td>ñ</td><td>ç</td><td>¨</td></tr>
<tr><td>HP German</td><td><ESC>(0G</td><td>£</td><td>$</td><td>§</td><td>Ä</td><td>Ö</td><td>Ü</td><td>^</td><td>`</td><td>ä</td><td>ö</td><td>ü</td><td>ß</td></tr>
<tr><td>HP Spanish</td><td><ESC>(1S</td><td>#</td><td>$</td><td>@</td><td>¡</td><td>Ñ</td><td>¿</td><td>°</td><td>`</td><td>{</td><td>ñ</td><td>}</td><td>~</td></tr>
</table>

ABICOMP Brazil / Portugal (13P)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	Ò 176	¡ 192	ò 208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ó 177	à 193	ó 209	225	241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Á 162	Ô 178	á 194	ô 210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Â 163	Õ 179	â 195	õ 211	227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ã 164	Ö 180	ã 196	ö 212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ä 165	Œ 181	ä 197	œ 213	229	245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ç 166	Ù 182	ç 198	ù 214	230	246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	È 167	Ú 183	è 199	ú 215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	É 168	Û 184	é 200	û 216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Ê 169	Ü 185	ê 201	ü 217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ë 170	Ÿ 186	ë 202	ÿ 218	234	250
B	11	27	+ 43	; 59	K 75	Õ 91	k 107	õ 123	139	155	Ì 171	¨ 187	ì 203	ß 219	235	251
C	12	28	, 44	< 60	L 76	Ã 92	l 108	ã 124	140	156	Í 172	£ 188	í 204	ª 220	236	252
D	13	29	- 45	= 61	M 77	Ç 93	m 109	ç 125	141	157	Î 173	´ 189	î 205	º 221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ï 174	§ 190	ï 206	¿ 222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	159	Ñ 175	° 191	ñ 207	± 223	239	255

PC-853 Latin3 (Turkish) (18U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	ċ 145	í 161	▒ 177	┴ 193	209	ß 225	241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ċ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	ℓ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	ŉ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	Ġ 228	˘ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	ġ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	ĉ 134	û 150	Ğ 166	Â 182	Ŝ 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ğ 167	À 183	ŝ 199	Î 215	Ħ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	İ 152	Ĥ 168	Ş 184	╚ 200	Ï 216	ħ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	ĥ 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	170	║ 186	╩ 202	┌ 218	Û 234	˙ 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ĝ 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	Ĵ 172	╝ 188	╠ 204	▄ 220	Ŭ 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ĝ 157	§ 173	Ż 189	═ 205	221	ŭ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	ż 190	╬ 206	Ì 222	238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ĉ 143	ĵ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

ABICOMP International (14P)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	Ò 176	¡ 192	ò 208	224	240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ó 177	à 193	ó 209	225	241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Á 162	Ô 178	á 194	ô 210	226	242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Â 163	Õ 179	â 195	õ 211	227	243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ã 164	Ö 180	ã 196	ö 212	228	244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ä 165	Œ 181	ä 197	œ 213	229	245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Ç 166	Ù 182	ç 198	ù 214	230	246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	È 167	Ú 183	è 199	ú 215	231	247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	É 168	Û 184	é 200	û 216	232	248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Ê 169	Ü 185	ê 201	ü 217	233	249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Ë 170	Ÿ 186	ë 202	ÿ 218	234	250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ì 171	¨ 187	ì 203	ß 219	235	251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Í 172	£ 188	í 204	ª 220	236	252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Î 173	´ 189	î 205	º 221	237	253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ï 174	§ 190	ï 206	¿ 222	238	254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	143	159	Ñ 175	° 191	ñ 207	± 223	239	255

PC-857 Latin5 (Turkish) (16U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	º 208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	ª 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	Ğ 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	ğ 167	À 183	Ã 199	Î 215	231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	İ 152	¿ 168	© 184	╚ 200	Ï 216	× 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ì 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ı 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	ÿ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Ş 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ş 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

PC-858 Multilingual Euro (13U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	ð 208	Ó 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	‗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	€ 213	Õ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

PC-861 Iceland (21U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	Á 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	þ 149	Í 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	Ó 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	Ý 151	Ú 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ý 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Ð 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	ð 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Þ 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

PC-860 Portugal (20U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	À 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	È 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Á 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Í 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ã 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

PC-863 Canadian French (23U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	¦ 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	¯ 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	‗ 141	Ù 157	¾ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

PC-865 Nordic (25U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	255

PC8 PC Nova (27Q)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	Ž 64	P 80	ž 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	ß 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	Š 91	k 107	š 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	Đ 92	l 108	đ 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	Ć 93	m 109	ć 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	Č 94	n 110	č 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

ISO8859 / 15 Latin9 (9N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	À 192	Ð 208	à 224	ð 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	€ 164	Ž 180	Ä 196	Ô 212	ä 228	ô 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Š 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	š 168	ž 184	È 200	Ø 216	è 232	ø 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	Œ 188	Ì 204	Ü 220	ì 236	ü 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	œ 189	Í 205	Ý 221	í 237	ý 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	Ÿ 190	Î 206	Þ 222	î 238	þ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

Turkish8 (8T)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	' 96	p 112	128	144	160	¯ 176	â 192	Å 208	ğ 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ç 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Ğ 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	— 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	İ 219	Š 235	ı 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	Ö 220	š 236	ö 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	Ş 221	Ú 237	ş 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	Ü 222	Ÿ 238	ü 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	£ 175	¢ 191	ü 207	ç 223	ÿ 239	255

Roman9 (4U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Ð 227	µ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	Ñ 182	ó 198	ø 214	Ì 230	– 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	ñ 183	ú 199	æ 215	Ó 231	¼ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	¡ 184	à 200	Ä 216	Ò 232	½ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ˆ 170	€ 186	ò 202	Ö 218	õ 234	º 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	˜ 172	¥ 188	ä 204	É 220	š 236	■ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

ISO8859 / 7 Latin / Greek (12N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	° 176	ΐ 192	Π 208	ΰ 224	π 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	‘ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	’ 162	² 178	Β 194	210	β 226	ς 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	€ 164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	₯ 165	΅ 181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	Ά 182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	― 175	Ώ 191	Ο 207	ί 223	ο 239	255

Roman Extension (0E)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	¯ 48	â 64	Å 80	Á 96	Þ 112	128	144	160	176	192	208	224	240
1	1	17	À 33	Ý 49	ê 65	î 81	Ã 97	þ 113	129	145	161	177	193	209	225	241
2	2	18	Â 34	ý 50	ô 66	Ø 82	ã 98	· 114	130	146	162	178	194	210	226	242
3	3	19	È 35	° 51	û 67	Æ 83	Ð 99	µ 115	131	147	163	179	195	211	227	243
4	4	20	Ê 36	Ç 52	á 68	å 84	ð 100	¶ 116	132	148	164	180	196	212	228	244
5	5	21	Ë 37	ç 53	é 69	í 85	Í 101	¾ 117	133	149	165	181	197	213	229	245
6	6	22	Î 38	Ñ 54	ó 70	ø 86	Ì 102	– 118	134	150	166	182	198	214	230	246
7	7	23	Ï 39	ñ 55	ú 71	æ 87	Ó 103	¼ 119	135	151	167	183	199	215	231	247
8	8	24	´ 40	¡ 56	à 72	Ä 88	Ò 104	½ 120	136	152	168	184	200	216	232	248
9	9	25	` 41	¿ 57	è 73	ì 89	Õ 105	ª 121	137	153	169	185	201	217	233	249
A	10	26	ˆ 42	¤ 58	ò 74	Ö 90	õ 106	º 122	138	154	170	186	202	218	234	250
B	11	27	¨ 43	£ 59	ù 75	Ü 91	Š 107	« 123	139	155	171	187	203	219	235	251
C	12	28	˜ 44	¥ 60	ä 76	É 92	š 108	■ 124	140	156	172	188	204	220	236	252
D	13	29	Ù 45	§ 61	ë 77	ï 93	Ú 109	» 125	141	157	173	189	205	221	237	253
E	14	30	Û 46	ƒ 62	ö 78	ß 94	Ÿ 110	± 126	142	158	174	190	206	222	238	254
F	15	31	£ 47	¢ 63	ü 79	Ô 95	ÿ 111	127	143	159	175	191	207	223	239	255

Greek8 (8G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	176	192	Ο 208	ύ 224	ο 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	161	177	Α 193	Π 209	α 225	π 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	162	178	Β 194	Ρ 210	β 226	ρ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	163	179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	166	182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	167	183	Η 199	215	η 231	ς 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	168	184	Θ 200	Χ 216	θ 232	χ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	169	185	Ι 201	Ψ 217	ι 233	ψ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	186	202	Ω 218	234	ω 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	171	187	Κ 203	ά 219	κ 235	έ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	172	ϊ 188	Λ 204	ή 220	λ 236	ί 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	173	189	Μ 205	ό 221	μ 237	ώ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	174	ϋ 190	Ν 206	222	ν 238	· 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	175	191	Ξ 207	223	ξ 239	255

Windows Greek (9G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	€ 128	144	160	° 176	ΐ 192	Π 208	ΰ 224	π 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	‘ 145	΅ 161	± 177	Α 193	Ρ 209	α 225	ρ 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	‚ 130	’ 146	Ά 162	² 178	Β 194	210	β 226	ς 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	ƒ 131	“ 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	„ 132	” 148	¤ 164	΄ 180	Δ 196	Τ 212	δ 228	τ 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	¥ 165	µ 181	Ε 197	Υ 213	ε 229	υ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	† 134	– 150	¦ 166	¶ 182	Ζ 198	Φ 214	ζ 230	φ 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	‡ 135	— 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	Έ 184	Θ 200	Ψ 216	θ 232	ψ 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	‰ 137	™ 153	© 169	Ή 185	Ι 201	Ω 217	ι 233	ω 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	Ί 186	Κ 202	Ϊ 218	κ 234	ϊ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	‹ 139	› 155	« 171	» 187	Λ 203	Ϋ 219	λ 235	ϋ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	Ό 188	Μ 204	ά 220	μ 236	ό 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	Ύ 190	Ξ 206	ή 222	ξ 238	ώ 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	░ 127	143	159	― 175	Ώ 191	Ο 207	ί 223	ο 239	255

PC8 Latin / Greek (12G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Α 128	Ρ 144	ι 160	░ 176	└ 192	╨ 208	ω 224	≡ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	Β 129	Σ 145	κ 161	▒ 177	┴ 193	╤ 209	ά 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	Γ 130	Τ 146	λ 162	▓ 178	┬ 194	╥ 210	έ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Δ 131	Υ 147	μ 163	│ 179	├ 195	╙ 211	ή 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Ε 132	Φ 148	ν 164	┤ 180	─ 196	╘ 212	ϊ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Ζ 133	Χ 149	ξ 165	╡ 181	┼ 197	╒ 213	ί 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Η 134	Ψ 150	ο 166	╢ 182	╞ 198	╓ 214	ό 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	Θ 135	Ω 151	π 167	╖ 183	╟ 199	╫ 215	ύ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	Ι 136	α 152	ρ 168	╕ 184	╚ 200	╪ 216	ϋ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Κ 137	β 153	σ 169	╣ 185	╔ 201	┘ 217	ώ 233	∙ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	Λ 138	γ 154	ς 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Μ 139	δ 155	τ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	Ν 140	ε 156	υ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Ξ 141	ζ 157	φ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ο 142	η 158	χ 174	╛ 190	╬ 206	▐ 222	ϵ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Π 143	θ 159	ψ 175	┐ 191	╧ 207	▀ 223	∩ 239	255

PC-851 Greece (10G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	Ί 144	ϊ 160	░ 176	└ 192	Τ 208	ζ 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	145	ΐ 161	▒ 177	┴ 193	Υ 209	η 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Ό 146	ό 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ύ 163	│ 179	├ 195	Χ 211	ι 227	φ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	Α 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	Ύ 149	Β 165	Κ 181	┼ 197	Ω 213	λ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ά 134	û 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	Δ 167	Μ 183	Ρ 199	β 215	ν 231	¸ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	Ώ 152	Ε 168	Ν 184	╚ 200	γ 216	ξ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	Ζ 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	Η 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ά 155	½ 171	╗ 187	╦ 203	█ 219	ρ 235	ϋ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	Θ 172	╝ 188	╠ 204	▄ 220	σ 236	ΰ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Έ 141	έ 157	Ι 173	Ξ 189	═ 205	δ 221	ς 237	ώ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	ή 158	« 174	Ο 190	╬ 206	ε 222	τ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ή 143	ί 159	» 175	┐ 191	Σ 207	▀ 223	΄ 239	255

PC-869 Greece (11G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	128	Ί 144	ϊ 160	░ 176	└ 192	Τ 208	ζ 224	- 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	129	Ϊ 145	ΐ 161	▒ 177	┴ 193	Υ 209	η 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	130	Ό 146	ό 162	▓ 178	┬ 194	Φ 210	θ 226	υ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	ύ 163	│ 179	├ 195	Χ 211	ι 227	φ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Α 164	┤ 180	─ 196	Ψ 212	κ 228	χ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	133	Ύ 149	Β 165	Κ 181	┼ 197	Ω 213	λ 229	§ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ά 134	Ϋ 150	Γ 166	Λ 182	Π 198	α 214	μ 230	ψ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	135	© 151	Δ 167	Μ 183	Ρ 199	β 215	ν 231	΅ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	· 136	Ώ 152	Ε 168	Ν 184	╚ 200	γ 216	ξ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	¬ 137	² 153	Ζ 169	╣ 185	╔ 201	┘ 217	ο 233	¨ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	¦ 138	³ 154	Η 170	║ 186	╩ 202	┌ 218	π 234	ω 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	‘ 139	ά 155	½ 171	╗ 187	╦ 203	█ 219	ρ 235	ϋ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	’ 140	£ 156	Θ 172	╝ 188	╠ 204	▄ 220	σ 236	ΰ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Έ 141	έ 157	Ι 173	Ξ 189	═ 205	δ 221	ς 237	ώ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	― 142	ή 158	« 174	Ο 190	╬ 206	ε 222	τ 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Ή 143	ί 159	» 175	┐ 191	Σ 207	▀ 223	΄ 239	255

PC8 Greek Alternate (437G) (14G)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	Α 128	Ρ 144	ι 160	░ 176	└ 192	╨ 208	ω 224	Ώ 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	Β 129	Σ 145	κ 161	▒ 177	┴ 193	╤ 209	ά 225	± 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	Γ 130	Τ 146	λ 162	▓ 178	┬ 194	╥ 210	έ 226	≥ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Δ 131	Υ 147	μ 163	│ 179	├ 195	╙ 211	ή 227	≤ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Ε 132	Φ 148	ν 164	┤ 180	─ 196	╘ 212	ϊ 228	⌠ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Ζ 133	Χ 149	ξ 165	╡ 181	┼ 197	╒ 213	ί 229	⌡ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Η 134	Ψ 150	ο 166	╢ 182	╞ 198	╓ 214	ό 230	÷ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	Θ 135	Ω 151	π 167	╖ 183	╟ 199	╫ 215	ύ 231	≈ 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	Ι 136	α 152	ρ 168	╕ 184	╚ 200	╪ 216	ϋ 232	° 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Κ 137	β 153	σ 169	╣ 185	╔ 201	┘ 217	ώ 233	£ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	Λ 138	γ 154	ς 170	║ 186	╩ 202	┌ 218	Ά 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Μ 139	δ 155	τ 171	╗ 187	╦ 203	█ 219	Έ 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	Ν 140	ε 156	υ 172	╝ 188	╠ 204	▄ 220	Ή 236	ⁿ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Ξ 141	ζ 157	φ 173	╜ 189	═ 205	▌ 221	Ί 237	² 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ο 142	η 158	χ 174	╛ 190	╬ 206	▐ 222	Ό 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Π 143	θ 159	ψ 175	┐ 191	╧ 207	▀ 223	Ύ 239	255

Ukrainian (14R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	А 128	Р 144	а 160	░ 176	└ 192	╨ 208	р 224	Ё 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	Б 129	С 145	б 161	▒ 177	┴ 193	╤ 209	с 225	ё 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	В 130	Т 146	в 162	▓ 178	┬ 194	╥ 210	т 226	Ґ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	Г 131	У 147	г 163	│ 179	├ 195	╙ 211	у 227	ґ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	Д 132	Ф 148	д 164	┤ 180	─ 196	╘ 212	ф 228	Є 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	Е 133	Х 149	е 165	╡ 181	┼ 197	╒ 213	х 229	є 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	Ж 134	Ц 150	ж 166	╢ 182	╞ 198	╓ 214	ц 230	І 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	З 135	Ч 151	з 167	╖ 183	╟ 199	╫ 215	ч 231	і 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	И 136	Ш 152	и 168	╕ 184	╚ 200	╪ 216	ш 232	Ї 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	Й 137	Щ 153	й 169	╣ 185	╔ 201	┘ 217	щ 233	ї 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	К 138	Ъ 154	к 170	║ 186	╩ 202	┌ 218	ъ 234	· 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	Л 139	Ы 155	л 171	╗ 187	╦ 203	█ 219	ы 235	√ 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	М 140	Ь 156	м 172	╝ 188	╠ 204	▄ 220	ь 236	№ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	Н 141	Э 157	н 173	╜ 189	═ 205	▌ 221	э 237	¤ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	О 142	Ю 158	о 174	╛ 190	╬ 206	▐ 222	ю 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	П 143	Я 159	п 175	┐ 191	╧ 207	▀ 223	я 239	255

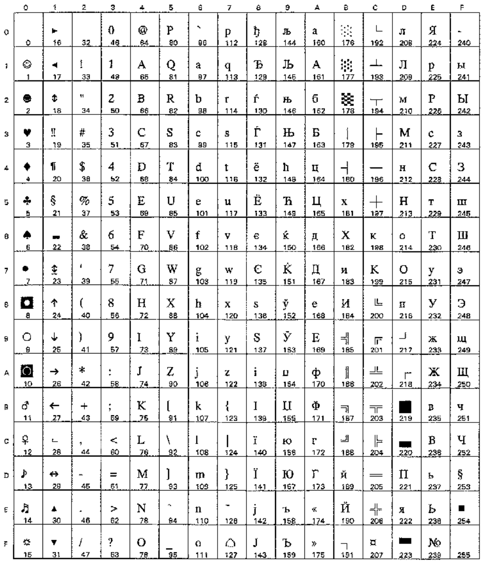
Russian-GOST (12R)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	► 16	32	0 48	@ 64	P 80	` 96	p 112	╧ 128	╔ 144	┌ 160	А 176	Р 192	а 208	р 224	Ё 240
1	☺ 1	◄ 17	! 33	1 49	A 65	Q 81	a 97	q 113	╨ 129	╗ 145	┐ 161	Б 177	С 193	б 209	с 225	ё 241
2	☻ 2	↕ 18	" 34	2 50	B 66	R 82	b 98	r 114	╤ 130	╝ 146	┘ 162	В 178	Т 194	в 210	т 226	↗ 242
3	♥ 3	‼ 19	# 35	3 51	C 67	S 83	c 99	s 115	╡ 131	╚ 147	└ 163	Г 179	У 195	г 211	у 227	↖ 243
4	♦ 4	¶ 20	$ 36	4 52	D 68	T 84	d 100	t 116	╢ 132	═ 148	─ 164	Д 180	Ф 196	д 212	ф 228	↙ 244
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117	╖ 133	║ 149	├ 165	Е 181	Х 197	е 213	х 229	↘ 245
6	♠ 6	▬ 22	& 38	6 54	F 70	V 86	f 102	v 118	╕ 134	╦ 150	┬ 166	Ж 182	Ц 198	ж 214	ц 230	→ 246
7	• 7	↨ 23	' 39	7 55	G 71	W 87	g 103	w 119	╥ 135	╣ 151	┤ 167	З 183	Ч 199	з 215	ч 231	← 247
8	◘ 8	↑ 24	(40	8 56	H 72	X 88	h 104	x 120	╙ 136	╩ 152	┴ 168	И 184	Ш 200	и 216	ш 232	↑ 248
9	○ 9	↓ 25	) 41	9 57	I 73	Y 89	i 105	y 121	╘ 137	╠ 153	├ 169	Й 185	Щ 201	й 217	щ 233	↓ 249
A	◙ 10	→ 26	* 42	: 58	J 74	Z 90	j 106	z 122	╒ 138	╬ 154	┼ 170	К 186	Ъ 202	к 218	ъ 234	÷ 250
B	♂ 11	← 27	+ 43	; 59	K 75	[91	k 107	{ 123	╜ 139	░ 155	█ 171	Л 187	Ы 203	л 219	ы 235	± 251
C	♀ 12	∟ 28	, 44	< 60	L 76	\ 92	l 108	| 124	╛ 140	▒ 156	▄ 172	М 188	Ь 204	м 220	ь 236	№ 252
D	♪ 13	↔ 29	- 45	= 61	M 77	] 93	m 109	} 125	╞ 141	▓ 157	▌ 173	Н 189	Э 205	н 221	э 237	¤ 253
E	♫ 14	▲ 30	. 46	> 62	N 78	^ 94	n 110	~ 126	╟ 142	╫ 158	▐ 174	О 190	Ю 206	о 222	ю 238	■ 254
F	☼ 15	▼ 31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	╓ 143	╪ 159	▀ 175	П 191	Я 207	п 223	я 239	255

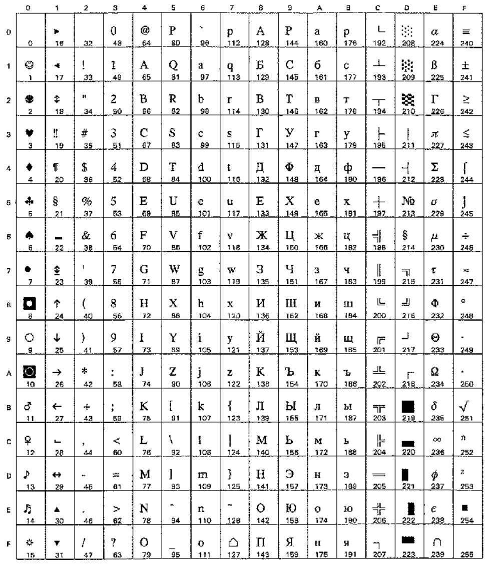
ISO8859 / 5 Latin / Cyrillic (10N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	0 48	@ 64	P 80	` 96	p 112	128	144	160	А 176	Р 192	а 208	р 224	№ 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	Ё 161	Б 177	С 193	б 209	с 225	ё 241
2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Ђ 162	В 178	Т 194	в 210	т 226	ђ 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	Ѓ 163	Г 179	У 195	г 211	у 227	ѓ 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Є 164	Д 180	Ф 196	д 212	ф 228	є 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ѕ 165	Е 181	Х 197	е 213	х 229	ѕ 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	І 166	Ж 182	Ц 198	ж 214	ц 230	і 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	Ї 167	З 183	Ч 199	з 215	ч 231	ї 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	Ј 168	И 184	Ш 200	и 216	ш 232	ј 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	Љ 169	Й 185	Щ 201	й 217	щ 233	љ 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	Њ 170	К 186	Ъ 202	к 218	ъ 234	њ 250
B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	Ћ 171	Л 187	Ы 203	л 219	ы 235	ћ 251
C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	Ќ 172	М 188	Ь 204	м 220	ь 236	ќ 252
D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	Н 189	Э 205	н 221	э 237	§ 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Ў 174	О 190	Ю 206	о 222	ю 238	ў 254
F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	Џ 175	П 191	Я 207	п 223	я 239	џ 255

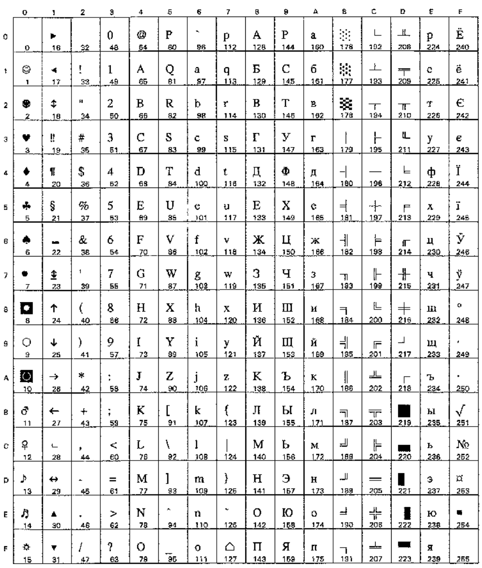
PC-855 Cyrillic (10R)



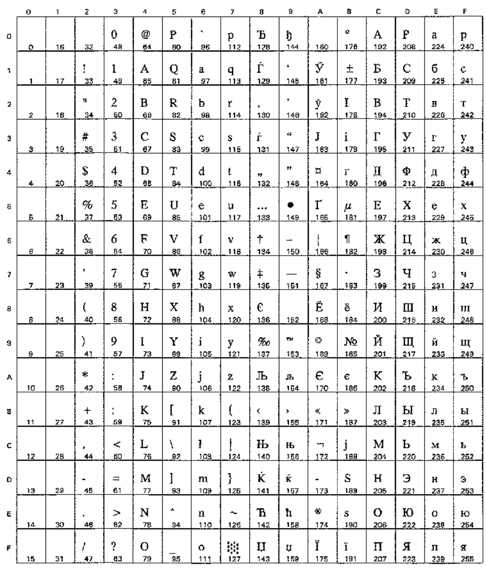
PC8 Bulgarian (13R)



PC-866 Cyrillic (3R)



Windows Cyrillic (9R)



US ASCII

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				0	@	P	`	p
1			!	1	A	Q	a	q			!	1	A	Q	a	q
2			"	2	B	R	b	r			"	2	B	R	b	r
3			#	3	C	S	c	s			#	3	C	S	c	s
4			$	4	D	T	d	t			$	4	D	T	d	t
5			%	5	E	U	e	u			%	5	E	U	e	u
6			&	6	F	V	f	v			&	6	F	V	f	v
7			'	7	G	W	g	w			'	7	G	W	g	w
8			(	8	H	X	h	x			(	8	H	X	h	x
9			)	9	I	Y	i	y			)	9	I	Y	i	y
A			*	:	J	Z	j	z			*	:	J	Z	j	z
B			+	;	K	[	k	{			+	;	K	[	k	{
C			,	<	L	\	l	|			,	<	L	\	l	|
D			-	=	M	]	m	}			-	=	M	]	m	}
E			.	>	N	^	n	~			.	>	N	^	n	~
F			/	?	O	_	o				/	?	O	_	o	

The following table shows characters that are only available in the matching character set. The numbers at the top of the table are hexadecimal code values so that characters will be replaced with the US ASCII character set. For other characters, see the US ASCII character set.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
UK ASCII I	£	$	@	[	\	]	^	`	{	|	}	~
French I	#	$	à	°	ç	§	^	`	é	ù	è	¨
Danish I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spanish	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Japanese	#	$	@	[	¥	]	^	`	{	|	}	~
Norwegian	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Danish II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
UK ASCII II	#	£	@	[	\	]	^	`	{	|	}	~
French II	#	â	à	î	ç	ê	û	ô	é	ú	è	ï
Dutch	#	$	@	[	]	ƒ	^	`	é	ĳ	è	¨
South African	#	ê	É	Ê	Ö	è	Ü	é	ë	ö	ô	ü

PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

PC-8 D/N

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	õ	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	Õ	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ã	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	Ã	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	ℓ	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	ŉ	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ŀ	³	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ŀ	¤	┐	╧	▀	∩	

PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	ð	Ó	-
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	Ð	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	‗
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	♠	▬	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	Ù	¹
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ý	³
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
E	♫	▲	.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	¯	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▀	´	

PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	đ	Ó	-
1	☺	◄	!	1	A	Q	a	q	ü	Ĺ	í	▒	┴	Đ	ß	˝
2	☻	↕	"	2	B	R	b	r	é	ĺ	ó	▓	┬	Ď	Ô	˛
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ń	ˇ
4	♦	¶	$	4	D	T	d	t	ä	ö	Ą	┤	─	ď	ń	˘
5	♣	§	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6	♠	▬	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
7	•	↨	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8	◘	↑	(	8	H	X	h	x	ł	ś	Ę	Ş	╚	ě	Ŕ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
A	◙	→	*	:	J	Z	j	z	Ő	Ü		║	╩	┌	ŕ	˙
B	♂	←	+	;	K	[	k	{	ő	Ť	ź	╗	╦	█	Ű	ű
C	♀	∟	,	<	L	\	l	|	î	ť	Č	╝	╠	▄	ý	Ř
D	♪	↔	-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
E	♫	▲	.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	■
F	☼	▼	/	?	O	_	o	⌂	Ć	č	»	┐	¤	▀	´	

PC-860

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	À	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	È	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ã	õ	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	Á	Ú	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	Ì	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	Ê	Õ	Ò	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	Í	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	Ô	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ù	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ã	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Â	Ó	»	┐	╧	▀	∩	

PC-863

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	¦	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	È	´	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Ê	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	Â	Ë	¨	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	Ï	¸	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	¶	û	³	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	¯	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	¤	Î	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ô	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	‗	Ù	¾	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	À	Û	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	§	ƒ	»	┐	╧	▀	∩	

PC-865

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	¤	┐	╧	▀	∩	

PC-8 Turkish

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	Ğ	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	ğ	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	İ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ı	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ş	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ş	»	┐	╧	▀	∩	

IBM Mode

PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▀	∩	

PC-8 D/N

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	õ	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	Õ	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ã	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	Ã	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	ℓ	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	¦	î	£	ŉ	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ŀ	³	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ŀ	¤	┐	╧	▀	∩	

PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	ð	Ó	-
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	Ð	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	‗
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	♠	▬	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	Ù	¹
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ý	³
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
E	♫	▲	.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	¯	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▀	´	

PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	đ	Ó	-
1	☺	◄	!	1	A	Q	a	q	ü	Ĺ	í	▒	┴	Đ	ß	˝
2	☻	↕	"	2	B	R	b	r	é	ĺ	ó	▓	┬	Ď	Ô	˛
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ń	ˇ
4	♦	¶	$	4	D	T	d	t	ä	ö	Ą	┤	─	ď	ń	˘
5	♣	§	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6	♠	▬	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
7	•	↨	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8	◘	↑	(	8	H	X	h	x	ł	ś	Ę	Ş	╚	ě	Ŕ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
A	◙	→	*	:	J	Z	j	z	Ő	Ü		║	╩	┌	ŕ	˙
B	♂	←	+	;	K	[	k	{	ő	Ť	ź	╗	╦	█	Ű	ű
C	♀	∟	,	<	L	\	l	|	î	ť	Č	╝	╠	▄	ý	Ř
D	♪	↔	-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
E	♫	▲	.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	■
F	☼	▼	/	?	O	_	o	⌂	Ć	č	»	┐	¤	▀	´	

PC-860

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	À	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	È	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ã	õ	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	Á	Ú	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	Ì	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	Ê	Õ	Ò	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	Í	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	Ô	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ù	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ã	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Â	Ó	»	┐	╧	▀	∩	

PC-863

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	¦	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	È	´	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Ê	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	Â	Ë	¨	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	Ï	¸	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	¶	û	³	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	¯	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	¤	Î	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ô	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	‗	Ù	¾	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	À	Û	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	§	ƒ	»	┐	╧	▀	∩	

PC-865

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	¦	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	¤	┐	╧	▀	∩	

PC-8 Turkish

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	Ğ	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	ğ	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	İ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	ⁿ
D	♪	↔	-	=	M	]	m	}	ı	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ş	«	╛	╬	▐	∈	■
F	☼	▼	/	?	O	_	o	⌂	Å	ş	»	┐	╧	▀	∩	

ANSI ASCII(0)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

9825 CHR. SET(1)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	π
C			,	<	L	√	l	⊢
D			-	=	M	]	m	→
E			.	>	N	↑	n	~
F			/	?	O	_	o	

FRENCH/GERMAN(2)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			´	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	¨
C			,	<	L	ç	l	˚
D			-	=	M	]	m	¨
E			.	>	N	^	n	'
F			/	?	O	_	o	

SCANDINAVIAN(3)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Ø	k	¨
C			,	<	L	Æ	l	˚
D			-	=	M	ø	m	¨
E			.	>	N	æ	n	˚
F			/	?	O	_	o	

SPANISH/LATIN (4)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			¿	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			´	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	~
C			,	<	L	¡	l	~
D			-	=	M	]	m	~
E			.	>	N	^	n	~
F			/	?	O	_	o	

JIS ASCII (6)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	¥	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

ROMAN8 EXT. (7)

	0	1	2	3	4	5	6	7
0				¯	â	Å	Á	Þ
1			À		ê	î	Ã	þ
2			Â		ô	Ø	ã	
3			È	°	û	Æ	Đ	
4			Ê	Ç	á	å	ð	
5			Ë	ç	é	í	Í	
6			Î	Ñ	ó	ø	Ì	–
7			Ï	ñ	ú	æ	Ó	¼
8			´	¡	à	Ä	Ò	½
9			`	¿	è	ì	Õ	ª
A			ˆ	¤	ò	Ö	õ	º
B			¨	£	ù	Ü	Š	«
C			˜	¥	ä	É	š	■
D			Ù	§	ë	ï	Ú	»
E			Û	ƒ	ö	ß	Ÿ	±
F			₤	¢	ü	Ô	ÿ	

ISO IRV (9)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			¤	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	‾
F			/	?	O	_	o	

ISO FRENCH(34)

	0	1	2	3	4	5	6	7
0				0	à	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	°	k	é
C			,	<	L	ç	l	ù
D			-	=	M	§	m	è
E			.	>	N	^	n	¨
F			/	?	O	_	o	

ISO U.K.(35)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	\	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	‾
F			/	?	O	_	o	

ISO ITALIAN(36)

	0	1	2	3	4	5	6	7
0				0	§	P	ù	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	°	k	à
C			,	<	L	ç	l	ò
D			-	=	M	é	m	è
E			.	>	N	^	n	ì
F			/	?	O	_	o	

ISO SPANISH(37)

	0	1	2	3	4	5	6	7
0				0	§	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			£	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	¡	k	°
C			,	<	L	Ñ	l	ñ
D			-	=	M	¿	m	ç
E			.	>	N	^	n	~
F			/	?	O	_	o	

ISO SWEDISH(30)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			¤	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Ä	k	ä
C			,	<	L	Ö	l	ö
D			-	=	M	Å	m	å
E			.	>	N	^	n	‾
F			/	?	O	_	o	

ISO SWEDISH: N(31)

	0	1	2	3	4	5	6	7
0				0	É	P	é	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			¤	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Ä	k	ä
C			,	<	L	Ö	l	ö
D			-	=	M	Å	m	å
E			.	>	N	Ü	n	ü
F			/	?	O	_	o	

ISO NORWAY 1(32)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Æ	k	æ
C			,	<	L	Ø	l	ø
D			-	=	M	Å	m	å
E			.	>	N	^	n	‾
F			/	?	O	_	o	

ISO GERMAN(33)

	0	1	2	3	4	5	6	7
0				0	§	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Ä	k	ä
C			,	<	L	Ö	l	ö
D			-	=	M	Ü	m	ü
E			.	>	N	^	n	ß
F			/	?	O	_	o	

ISO PORTUGUESE (38)

	0	1	2	3	4	5	6	7
0				0	§	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Ã	k	ã
C			,	<	L	Ç	l	ç
D			-	=	M	Õ	m	õ
E			.	>	N	^	n	°
F			/	?	O	_	o	

ISO NORWAY 2 (39)

	0	1	2	3	4	5	6	7
0				0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			§	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	Æ	k	æ
C			,	<	L	Ø	l	ø
D			-	=	M	Å	m	å
E			.	>	N	^	n	|
F			/	?	O	_	o	

Symbol sets supported by the printer's intellifont compatible typefaces

PCL Symbol Set		Typeface															
Set ID	Symbol Set	Brougham	Letter Gothic	PC Tennessee	Oklahoma	Guatemala	Connecticut	Cleveland	Maryland	Utah	Utah Cond.	Antique Oakland	Alaska Medium	PC Brussels	LetterGothic 16.66**	OCR-A	OCR-B
0D	ISO 60 Norwegian 1*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0F	ISO 25 French*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0G	HP German*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0I	ISO 15 Italian*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0K	ISO 14 JIS ASCII*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0N	ISO 8859-1 Latin 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0S	ISO 11 Swedish*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
0U	ISO 6 ASCII*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1D	ISO 61 Norwegian 2*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1E	ISO 4 United Kingdom*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1F	ISO 69 French*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1G	ISO 21 German*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1S	HP Spanish*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
1U	Legal	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
2K	ISO 57 Chinese*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
2N	ISO 8859-2 Latin 2	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
2S	ISO 17 Spanish*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
2U	ISO 2 International*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
3S	ISO 10 Swedish*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
4S	ISO 16 Portuguese*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
5M	PS Math	•	•	•	•	•	•	•	•	•	•	•	•	•			
5N	ISO 8859-9 Latin 5	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
5S	ISO 84 Portuguese*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
5T	Windows 3.1 Latin 5	•	•	•	•	•	•	•	•	•	•	•	•	•			
6J	Microsoft Publishing	•	•	•	•	•	•	•	•	•	•	•	•	•			
6M	Ventura Math	•	•	•	•	•	•	•	•	•	•	•	•	•			
6N	ISO 8859-10 Latin 6	•	•	•	•	•	•	•	•	•	•	•	•	•	•		

* The symbol sets marked with an * are variations of the Roman-8 symbol set.

** LetterGothic 16.66, OCR-A and OCR-B are bitmapped fonts.

PCL Symbol Set		Typeface															
Set ID	Symbol Set	Brougham	Letter Gothic	PC Tennessee	Oklahoma	Guatemala	Connecticut	Cleveland	Maryland	Utah	Utah Cond.	Antique Oakland	Alaska Medium	PC Brussels	LetterGothic 16.66**	OCR-A	OCR-B
6S	ISO 85 Spanish*	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
7J	Desk Top	•	•	•	•	•	•	•	•	•	•	•	•	•			
8M	Math-8	•	•	•	•	•	•	•	•	•	•	•	•	•			
8U	Roman-8	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
9E	Windows 3.1 Latin 2	•	•	•	•	•	•	•	•	•	•	•	•	•			
9J	PC-1004 (OS/2)	•	•	•	•	•	•	•	•	•	•	•	•	•			
9T	PC Turkish	•	•	•	•	•	•	•	•	•	•	•	•	•			
9U	Windows 3.0 Latin 1	•	•	•	•	•	•	•	•	•	•	•	•	•			
10J	PS Text	•	•	•	•	•	•	•	•	•	•	•	•	•			
10U	PC-8	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
11U	PC-8 D/N	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
12J	MC Text	•	•	•	•	•	•	•	•	•	•	•	•	•			
12U	PC-850	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
13J	Ventura International	•	•	•	•	•	•	•	•	•	•	•	•	•			
14J	Ventura US	•	•	•	•	•	•	•	•	•	•	•	•	•			
15U	Pi Font	•	•	•	•	•	•	•	•	•	•	•	•	•			
17U	PC-852	•	•	•	•	•	•	•	•	•	•	•	•	•			
19L	Windows Baltic	•	•	•	•	•	•	•	•	•	•	•	•	•			
19U	Windows 3.1 Latin 1	•	•	•	•	•	•	•	•	•	•	•	•	•			
26U	PC-775	•	•	•	•	•	•	•	•	•	•	•	•	•			
19M	Symbol																
579L	Wingdings																
0O	OCR-A															•	
1O	OCR-B																•

* The symbol sets marked with an * are variations of the Roman-8 symbol set.
** LetterGothic 16.66, OCR-A and OCR-B are bitmapped fonts.

Symbol sets supported by the printer's TrueType™ and Type 1 Font Compatible, and original typefaces

PCL Symbol Set		Typeface											
Set ID	Symbol Set	Tennessee	Helsinki	BR Symbol	W Dingbats	Atlanta Book	Copenhagen	Portugal	Calgary	Germany	San Diego	Bermuda Script	US Roman
0D	ISO 60 Norwegian 1*	•	•			•	•	•	•	•	•	•	•
0F	ISO 25 French*	•	•			•	•	•	•	•	•	•	•
0G	HP German*	•	•			•	•	•	•	•	•	•	•
0I	ISO 15 Italian*	•	•			•	•	•	•	•	•	•	•
0K	ISO 14 JIS ASCII*	•	•			•	•	•	•	•	•	•	•
0N	ISO 8859-1 Latin 1	•	•			•	•	•	•	•	•	•	•
0S	ISO 11 Swedish*	•	•			•	•	•	•	•	•	•	•
0U	ISO 6 ASCII*	•	•			•	•	•	•	•	•	•	•
1D	ISO 61 Norwegian 2*	•	•			•	•	•	•	•	•	•	•
1E	ISO 4 United Kingdom*	•	•			•	•	•	•	•	•	•	•
1F	ISO 69 French*	•	•			•	•	•	•	•	•	•	•
1G	ISO 21 German*	•	•			•	•	•	•	•	•	•	•
1S	HP Spanish*	•	•			•	•	•	•	•	•	•	•
1U	Legal	•	•			•	•	•	•	•	•	•	•
2K	ISO 57 Chinese*	•	•			•	•	•	•	•	•	•	•
2N	ISO 8859-2 Latin 2	•	•							•			
2S	ISO 17 Spanish*	•	•			•	•	•	•	•	•	•	•
2U	ISO 2 International*	•	•			•	•	•	•	•	•	•	•
3S	ISO 10 Swedish*	•	•			•	•	•	•	•	•	•	•
4S	ISO 16 Portuguese*	•	•			•	•	•	•	•	•	•	•
5M	PS Math	•	•			•	•	•	•	•	•	•	•
5N	ISO 8859-9 Latin 5	•	•							•			
5S	ISO 84 Portuguese*	•	•			•	•	•	•	•	•	•	•
5T	Windows 3.1 Latin 5	•	•							•			
6J	Microsoft Publishing	•	•			•	•	•	•	•	•	•	•
6M	Ventura Math	•	•			•	•	•	•	•	•	•	•
6N	ISO 8859-10 Latin 6	•	•										
6S	ISO 85 Spanish*	•	•			•	•	•	•	•	•	•	•
7J	Desk Top	•	•			•	•	•	•	•	•	•	•
8M	Math-8	•	•			•	•	•	•	•	•	•	•
8U	Roman-8	•	•			•	•	•	•	•	•	•	•

The symbol sets marked with an * are variations of the Roman-8 symbol set.

PCL Symbol Set		Typeface											
Set ID	Symbol Set	Tennessee	Helsinki	BR Symbol	W Dingbats	Atlanta Book	Copenhagen	Portugal	Calgary	Germany	San Diego	Bermuda Script	US Roman
9E	Windows 3.1 Latin 2	•	•							•			
9J	PC-1004 (OS/2)	•	•										
9T	PC Turkish	•	•							•			
9U	Windows 3.0 Latin 1	•	•			•	•	•	•	•	•	•	•
10J	PS Text	•	•			•	•	•	•	•	•	•	•
10U	PC-8	•	•			•	•	•	•	•	•	•	•
11U	PC-8 D/N	•	•			•	•	•	•	•	•	•	•
12J	MC Text	•	•			•	•	•	•	•	•	•	•
12U	PC-850	•	•			•	•	•	•	•	•	•	•
13J	Ventura International	•	•			•	•	•	•	•	•	•	•
14J	Ventura US	•	•			•	•	•	•	•	•	•	•
15U	Pi Font	•	•			•	•	•	•	•	•	•	•
17U	PC-852	•	•							•			
19L	Windows Baltic	•	•										
19U	Windows 3.1 Latin 1	•	•			•	•	•	•	•	•	•	•
26U	PC-775	•	•										
19M	Symbol			•									
579L	Wingdings				•								
0O	OCR-A												
1O	OCR-B												

The symbol sets marked with an * are variations of the Roman-8 symbol set.

Quick reference for commands

Bar code control

The printer can print bar codes in the HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes.

Print bar codes or expanded characters

Code ESC i
Dec 27 105
Hex 1B 69

Format: ESC i n ... n \

Creates bar codes or expanded characters according to the segment of parameters "n ... n". For more information about parameters, see the following Definition of Parameters. This command must end with the " \ " code (5CH).

Definition of Parameters

This bar code command can have the following parameters in the parameter segment (n ... n). As parameters are effective within the single command syntax ESC i n ... n \, they don't apply in the bar code commands. If certain parameters are not given, they take the preset settings. The last parameter must be the bar code data start ('b' or 'B') or the expanded character data start ('l' or 'L'). Other parameters can be given in any sequence. Each parameter can start with a lower-case or upper-case character, for example, 't0' or 'T0', 's3' or 'S3' and so one.

Bar code mode

n = 't0' or 'T0	CODE 39 (default)
n = 't1' or 'T1	Interleaved 2 of 5
n = 't3' or 'T3'	FIM (US-Post Net)
n = 't4' or 'T4'	Post Net (US-Post Net)
n = 't5' or 'T5	EAN 8, EAN 13, or UPC A
n = 't6' or 'T6	UPC E
n = 't9' or 'T9	Codabar
n = 't12' or 'T12	Code 128 set A
n = 't13' or 'T13	Code 128 set B
n = 't14' or 'T14	Code 128 set C
n = 't130' or 'T130	ISBN (EAN)
n = 't131' or 'T131	ISBN (UPC-E)
n = 't132' or 'T132	EAN 128 set A
n = 't133' or 'T133	EAN 128 set B
n = 't134' or 'T134	EAN 128 set C

This parameter selects the bar code mode as shown above. When n is 't5' or 'T5' the bar code mode (EAN 8, EAN 13, or UPC A) varies according to the number of characters in the data.

Bar Code, expanded character, line block drawing and box drawing

n = 's0' or 'S0	3: 1 (default)
n = 's1' or 'S1	2: 1
n = 's3' or 'S3	2.5: 1

This parameter selects the bar code style as above. When the EAN 8, EAN 13, UPC-A, Code 128 or EAN 128 bar code mode is selected, this bar code style parameter is ignored.

Expanded Character
'S'
0 = White
1 = Black
2 = Vertical stripes
3 = Horizontal stripes
4 = Cross hatch

For example 'S' n1 n2
n1 = Background fill pattern
n2 = Foreground fill pattern

If 'S' is followed by only one parameter, the parameter is a foreground fill pattern.

Line block drawing & box drawing
"S"
1 = Black
2 = Vertical stripes
3 = Horizontal stripes
4 = Cross hatch

Bar Code

n = 'mnnn' or 'Mnnn' (nnn = 0 ~ 32767)

This parameter shows the bar code width. The unit of 'nnn' is a percentage.

Bar code human readable line ON or OFF

n = 'r0' or 'R0	Human readable line OFF
n = 'r1' or 'R1	Human readable line ON

Preset: Human readable line ON
(1) 'T5' or 't5'
(2) 'T6' or 't6'
(3) 'T130' or 't130'
(4) 'T131' or 't131'

Preset: Human readable line OFF
All others

This parameter shows whether or not the printer prints the human readable line below the bar code. Human readable characters are always printed with OCR-B font of 10 pitch and all the current character style enhancements are masked. The factory setting is determined by the bar code mode selected by 't' or 'T'.

Quiet zone

n = 'onnn' or 'Onnn' (nnn = 0 ~ 32767)

Quiet zone is the space on both sides of the bar codes. Its width can be shown using the units that are set by the 'u' of 'U' parameter. (For the description of 'u' or 'U' parameter, see the next section.) The factory setting of the quiet-zone width is 1 inch.

Bar code, expanded character unit, line block drawing and box drawing

n = 'u0' or 'U0	mm (preset)
n = 'u1' or 'U1	1/10
n = 'u2' or 'U2	1/100
n = 'u3' or 'U3	1/12
n = 'u4' or 'U4	1/120
n = 'u5' or 'U5	1/10 mm
n = 'u6' or 'U6	1/300
n = 'u7' or 'U7	1/720

This parameter shows the measurement units of X-axis offset, Y-axis offset, and bar code height.

Bar code, expanded character, line block drawing and box drawing offset in X-axis

n = 'xnnn' or 'Xnnn'

This parameter shows the offset from the left margin in the 'u'- or 'U'-specified unit.

Bar code & expanded character offset in Y-axis

n = 'ynnn' or 'Ynnn'

This parameter shows the downward offset from the current print position in the 'u'- or 'U'-specified unit.

Bar code, expanded character, line block drawing and box drawing height

n = 'hnnn', 'Hnnn', 'dnnn', or 'Dnnn'

(1) EAN13, EAN8, UPC-A, ISBN (EAN13, EAN8, UPC-A),
ISBN (UPC-E): 22 mm
(2) UPC-E: 18 mm
(3) Others: 12 mm

Expanded characters → 2.2 mm (preset)
Line block drawing and box drawing →1 dot

This parameter shows the height of bar codes or expanded characters as shown above. It can start with 'h', 'H', 'd', or 'D'. The height of bar codes is shown in the 'u'- or 'U'-specified unit. The factory setting of the bar code height (12 mm, 18 mm or 22 mm) is determined by the bar code mode selected by 't' or 'T'.

Expanded character width, line block drawing and box drawing

n = 'wnnn' or 'Wnnn'

Expanded character→ 1.2 mm
Line block drawing and box drawing→ 1 dot

This parameter shows the width of expanded characters as shown above.

Expanded character rotation

n = 'a0' or 'A1 'Upright (preset)
n = 'a1' or 'A1 'Rotated 90 degrees
n = 'a2' or 'A2 'Upside down, rotated 180 degrees
n = 'a3' or 'A3 'Rotated 270 degrees

Bar code data start

n = "b" or "B"

Data that follows 'b' or 'B' is read in as bar code data. Bar code data must end with the ' \ ' code (5CH), which also ends this command. The acceptable bar code data is determined by the bar code mode selected by 't' or 'T'.

■ When CODE 39 is selected with the parameter 't0' or 'T0'

Forty three characters '0' to '9', 'A' to 'Z', '-', ' . ', ' (space)', '$', ' / ', '+', and '%' can be accepted as bar code data. Other characters will cause a data error. The number of characters for bar codes is not limited. The bar code data automatically starts and ends with an asterisk ' * ' (start character and stop character). If the received data has an asterisk ' * ' at the beginning or end, the asterisk is regarded as a start character or stop character.

■ When Interleaved 2 of 5 is selected with the parameter 't1' or 'T1':

Ten numerical characters '0' to '9' can be accepted as bar code data. Other characters cause a data error. The number of characters for bar codes is not limited. Because this mode of bar codes needs even characters, if the bar code data has odd characters, '0' is automatically added to the end of the bar code data.

■ When FIM (US-Post Net) is selected with the parameter 't3' or 'T3'

Characters 'A' to 'D' are valid and one digit of data can be printed. Upper-case and lower-case alphabet characters can be accepted.

■ When Post Net (US-Post Net) is selected with the parameter 't4' or 'T4'

Numbers '0' to '9' can be data and it must end with a check digit. '?' can be used instead of the check digit.

■ When EAN 8, EAN 13, or UPC A is selected with the parameter 't5' or 'T5'

Ten numbers '0' to '9' can be accepted as bar code data. The number of characters for bar codes is limited as follows:

EAN 8: Total 8 digits (7 digits + 1 check digit)
EAN 13: Total 13 digits (12 digits + 1 check digit)
UPC A: Total 12 digits (11 digits + 1 check digit)

A number of characters other than above will cause data error that results in the bar code data being printed as normal print data. If the check digit is not correct, the printer calculates the correct check digit automatically so that the correct bar code data will be printed. When EAN13 is selected, adding '+' and a two-digit or five-digit number after the data can create an add-on code.

■ When UPC-E is selected with the parameter "t6" or "T6":

The numbers '0' to '9' can be accepted as bar code data.

1 Eight digits (standard format) The first character must be '0' and the data must end with a check digit.
Total eight digits = '0' plus 6 digits plus 1 check digit.
2 Six digits The first character and the last check digit are removed from the eight digit data.

1: For eight digits, '?' can be used instead of a check digit.
2: Adding '+' and two-digit or five-digit number after the data creates an add-on code for all six and eight digit formats.

■ When Codebar is chosen with the parameter 't9' or 'T9'

Characters '0' to '9', '-', ' . ', '$', '/', '+', ' : ' can be printed. Characters 'A' to 'D' can be printed as a start-stop code, which can be upper case or lower case. If there is no start-stop code, errors will happen. A check digit cannot be added and using '?' causes errors.

■ When Code 128 Set A, Set B, or Set C is selected with the parameter 't12' or 'T12,' 't13' or 'T13,' or 't14' or 'T14'

Code 128 sets A, B and C can be individually selected. Set A indicates characters Hex 00 to 5F. Set B includes characters Hex 20 to 7F. Set C includes the pairs 00 to 99. Switching is allowed between the code sets by sending %A, %B, or %C. FNC 1, 2, 3, and 4 are produced with %1, %2, %3, and %4. The SHIFT code, %S, allows temporary switching (for one character only) from set A to set B and vice versa. The '%' character can be encoded by sending it twice.

- When ISBN (EAN) is selected with the parameter 't130' or 'T130'

The same rules apply as for 't5' or 'T5'.

- When ISBN (UPC-E) is selected with the parameter 't131' or 'T131':

The same rules apply as for 't6' or 'T6'.

- When EAN 128 set A, set B or set C is selected with the parameter 't132' or 'T132', 't133' or 'T133' or 't134' or 'T134'

The same rules apply as for 't12' or 'T12', 't13' or 'T13', or 't14' or 'T14'.

Box drawing

ESC i ... E (or e)

'E' or 'e' is a terminator.

Line block drawing

ESC i ... V (or v)

'V' or 'v' is a terminator.

Expanded character data start

n = 'l' or 'L'

Data that follows 'l' or 'L' is read as expanded character data (or labeling data). Expanded character data must end with the ' \ ' code (5CH), which also ends this command.

```
WIDTH "LPT1:",255

'CODE 39
LPRINT CHR$(27);"it0r1s0o0x00y00bCODE39?\";

'Interleaved 2 of 5
LPRINT CHR$(27);"it1r1s0o0x00y20b123456?\";

'FIM
LPRINT CHR$(27);"it3r1o0x00y40bA\";

'Post Net
LPRINT CHR$(27);"it4r1o0x00y60b1234567890?\";

'EAN-8
LPRINT CHR$(27);"it5r1o0x00y70b1234567?\";

'UPC-A
LPRINT CHR$(27);"it5r1o0x50y70b12345678901?\";

'EAN-13
LPRINT CHR$(27);"it5r1o0x100y70b123456789012?\";

'UPC-E
LPRINT CHR$(27);"it6r1o0x150y70b0123456?\";

'Codabar
LPRINT CHR$(27);"it9r1s0o0x00y100bA123456A\";

'Code 128 set A
LPRINT CHR$(27);"it12r1o0x00y120bCODE128A12345?\";

'Code 128 set B
LPRINT CHR$(27);"it13r1o0x00y140bCODE128B12345?\";

'Code 128 set C
LPRINT CHR$(27);"it14r1o0x00y160b";CHR$(1);CHR$(2);"?\";

'ISBN(EAN)
LPRINTCHR$(27);"it130r1o0x00y180b123456789012?+12345\";

'EAN 128 set A
LPRINT CHR$(27);"it132r1o0x00y210b1234567890?\";

LPRINT CHR$(12)
END
```

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